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# A
# NEW SYSTEM
# OF
# Practical Husbandry;

By JOHN MILLS, Eſq; F.R.S.

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> Omnium rerum ex quibus aliquid conquiritur, nihil eſt AGRICULTURA melius, nihil uberius, nihil dulcius, nihil homide, nihil libero dignius.
>
> CIC. de OFF. lib. i.

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# PREFACE.

HAVING, in the former volumes of this work, conducted the Huſbandman, by the path of Experiment, where experiments could be had, through the various methods of improving and managing every kind of ſoil, and of cultivating the ſeveral productions of the field, which have been found to be the moſt uſeful in life; I now bring him into the Garden, an object of great pleaſure, and not leſs profit, when attended to with due care and judgment.---In this branch of Huſbandry, for ſo one may ſurely call the uſeful parts of Gardening, to which alone I have here reſtricted myſelf, men not leſs eminent for the accompliſhments of their minds, than for their birth, rank, and fortune, have taken a laudable pride in rendering themſelves conſpicuous. There are, perhaps, but few inſtances in antient or in modern times, of perſons famous in any ſphere of life, who have not, in their leiſure and retired hours, ſhewn a love for, and taſte in, this highly rational and inſtructive amuſement;

which has ever been juſtly eſteemed an occupation worthy of the greateſt heroes and philoſophers. --- Plato and his Academy, at Athens; Epicurus, and Metrodorus, in the ſame powerful and polite city; Democritus, at Abdera; the elder Cato, Lucullus, Cicero, and Pliny at Rome; and the emperor Diocleſian, at Salona; have ennobled this Art beyond all encomium. --- In later times, one of the beſt of men, and ſweeteſt of lyric bards, the amiable Cowley, comforted himſelf in his garden for the ſlights and ingratitude of the world: Mr. Evelyn's patriotic ſpirit rendered his plantations a ſource of uſeful inſtructions to mankind: Lord Cobham has left in the beautiful gardens of Stow, a ſuperb monument of his refined taſte: Mr. Pope's immortal fame will tranſmit to our lateſt poſterity the pleaſing remembrance of his delightful embelliſhments at Twickenham; the beauties of which place are now heightened by the elegant taſte of Mr. Horace Walpole, in this, as in all other branches of the polite Arts. Here too, I again[a] mention with ſingular pleaſure, and with an earneſt wiſh that many of our illuſtrious gentry would imitate the fine example, the Honourable Mr. Hamilton's improvements at Pains-Hill, where he has converted what was before a deſart, into one of the moſt beautiful ſpots in this kingdom. But I am ſorry to be obliged to add, that the gentlemen of diſtinction and fortune in this country, in general, --- gentlemen whoſe liberal education and extenſive knowledge ſhould naturally open their minds, and turn them to a habit of experiments, from whence the beſt, perhaps the only perfect, acquaintance with nature can be obtained, leave this delightful field too--too much, to the care and direction of men, who, having taken implicitly from others, and learnt as it were by rote, the little all of their ſkill therein, and being beſides unaccuſtomed to think for themſelves, or to reflect on what they ſee daily, have neither the underſtanding, nor inclination, to quit the beaten track in which they have been trained.

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[a] See *Vol.* III. *p.* 395.

M. le Noſtre firſt revived Gardening among the moderns; M. de la Quintinie proceeded farther; and, among others of our countrymen, Meſſieurs London, Wiſe, Bradley, Laurence, Fairchild, and Miller, have greatly contributed to its improvement.

I have here endeavoured to diveſt this Art of all the cant expreſſions, and unintelligible reaſonings, with which moſt of the writers who have treated of it abound; in order thereby to allure gentlemen to a greater attention to this moſt pleaſing of all rural employments: --- moſt pleaſing, becauſe it affords an uninterrupted and almoſt infinite variety of experiments, in which the conſtant riſe and growth of plants give the ingenious and inquiſitive huſbandman a kind of creative power. It may be objected, that, to fit a perſon for the ſuperintendance of a garden, requires ſo long a ſeries of experience, as few gentlemen are willing to ſubmit to. But thoſe who ſtart this difficulty ſhould conſider, that while they are acquiring that experience, their very errors become their beſt inſtructors; and that a cloſe attention to the ways of Nature, and to them only, will lead them into her moſt ſecret receſſes.--If the great Cyrus delighted in entertaining his gueſts with fruits of his own raiſing; ſurely a no leſs conſcious ſatisfaction will ariſe in the breaſt of every hoſpitable man, when he preſents to his friends the choiceſt products of the labour of his hands: nor will the ſocial glaſs have a leſs pleaſing reliſh, becauſe it proceeds from fruit of its owner's growth.--From this diſpoſition of minds of a ſuperior caſt, aroſe the ſucceſs, ſo juſtly celebrated by Pliny, of the triumphal hands of the ancient Romans; and from the diligent purſuits of ſuch minds it is, that the perfection of Gardening can alone be expected.

I flatter myſelf that every candid reader of this work will acquit me of having ſought occaſion to cenſure other writers: for a carping temper is my averſion. Far from entertaining a ſpirit of that kind, I have moſt gladly embraced every opportunity of commending thoſe who have ſeemed to me to merit praiſe; and rather than find fault where it was not neceſſary, I have often paſſed over in ſilence, errors which might have been noticed with ſome ſeverity.---But that ſilence could not, in juſtice to my ſubject, be extended to an Author, who, by his undiſputed character for knowledge, and by his moſt extenſive practice in Gardening, is deſervedly become the guide of Europe in this branch of cultivation. If, therefore, I have preſumed, in ſome inſtances, to differ in opinion from Mr. Philip Miller, of Chelſea; and if, through the earneſtneſs of my deſire to give the beſt information in my power, any warmth of expreſſion may chance to have dropped from my pen, when I eſpouſe a practice different from that which he recommends; I earneſtly entreat the reader to impute it to the true cauſe, namely, my zeal to prevent his being miſled by ſome miſtakes which have eſcaped that celebrated writer; for I take this opportunity of declaring, that if I had not thought him worthy of the utmoſt attention of every perſon who ſhall purſue this moſt delightful ſtudy, I ſhould not, on any occaſion, have endeavoured to refute his opinions. The reader muſt judge between us, in this, on my ſide very unequal conteſt. --- It may be ſaid, that I might ſtill have obſerved my general rule, of being ſilent where I could not commend: and indeed, I ſhould gladly have perſiſted in that method, which would have been by far the moſt agreeable to me, did not the juſtice which I owe to the Public call upon me to give reaſons for my thinking differently from ſo eſtabliſhed a maſter. --- It was the more indiſpenſably incumbent on me to take ſome notice of his inadvertencies, as his book is in the hands of almoſt every one, and is, very juſtly in moſt things, looked upon as the beſt of guides.

In this volume, as in all the former parts of my work, I have endeavoured to point out, in the ſtrongeſt manner, the advantages which ariſe from a judicious improvement of ſoils, and from keeping the ground clean and looſe. Wherever ſufficient attention is paid to theſe eſſential principles of all cultivation, the uſe of dung will become leſs neceſſary, than can be conceived by thoſe who have not experienced it. The importance of theſe objects is ſo great, that it cannot be too often, or too ſtrongly, inculcated.

Many of my readers may, at firſt ſight, think that I mean to extend the Kitchen Garden to an unreaſonable ſize, by allowing to each plant ſo much room as is adviſed in the firſt Section of this fourth part of my Treatiſe on Huſbandry: but Mr. Philip Miller's conſtant directions to that effect, and the unvaried ſucceſs of M. de Chateauvieux's experiments, ſeem fully to juſtify what I have ſaid on this ſubject; and I will venture to aſſure every gentleman who ſhall put it in practice, that he will not find any cauſe to repent the trial.

The pleaſure and profit ariſing from Fruit-trees, which are here the ſubject of my ſecond and third Sections, are well known. Their product is not only agreeable to the palate, but, when uſed with moderation, conduces greatly to our health. To the fruits of the Orchard, and of the various fruit-bearing ſhrubs here noticed, we owe our Cyder, Perry, and many other excellent and wholeſome liquors, the manner of making which will be explained in the ſequel of this work.

A due attention to the diſtempers of fruit-trees, which are treated of in the fourth Section, might, in time, rid us of one of the worſt calamities that can befall them. Every hedge upbraids us with our neglect in not properly guarding againſt them, by carefully deſtroying the caterpillars and their eggs.

The importance of the fifth and ſixth Sections, conſidered as the foundation of a moſt beneficial commerce to our colonies, and conſequently to their mother-country, is ſo ſtrongly enforced by the rewards nobly offered by our moſt excellent Society for the Encouragement of Arts, Manufactures, and Commerce, that I ſhall not attempt to enlarge here upon the vaſt advantages which muſt ariſe from a proper culture of the Vine, and of Olive-trees, in ſuitable parts of our immenſe poſſeſſions in America.

I cloſe this volume with ample directions for the culture and management of Hops, which are a neceſſary ingredient in the common healthy drink of this country, the manner of brewing which, and of making and managing all other fermented liquors, will be treated of fully in the beginning of my next Volume.

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# PRACTICAL HUSBANDRY.

## PART. IV.

## CHAP. I.

## OF GARDENING;

### SO FAR AS IS PROFITABLE TO THE FARMER, AND TO THE COUNTRY GENTLEMAN.

THE generality of writers upon this ſubject, and indeed moſt gardeners, in their practice, have, at leaſt till of late years, treated the pleaſure garden, the fruit garden, and the kitchen garden, as three quite diſtinct and ſeparate objects, not only in point of culture, but even of ſituation, ſoil, and incloſure. They are undoubtedly right as to the firſt: but I ſee no reaſon for disjoining the two laſt, unleſs it be in written accounts, where, for the ſake of greater order and perſpicuity, and for the convenience of the reader, their ſeveral products, and the different ways of managing them, may, with propriety, be given ſingly, as will be the method here.

The pleaſure or flower garden, being intended ſolely for ornament and recreation, does not belong to this work, the main deſign of which is utility. I therefore ſhall only obſerve, in relation thereto, that the gentleman who can afford to be at the expence of ſuch a garden, for the laying out, planting, and managing of which he will find ample and excellent directions in Mr. Miller's Dictionary, will, of courſe, place it in a properly conſpicuous part, where it may afford the greateſt entertainment to the eye. Conſequently he will order it to be made next to, or juſt againſt, the back front of his houſe, from whence a deſcent of at leaſt three, but rather of ſix or ſeven, ſteps will ſingularly embelliſh the whole. He will allow room for a ſufficiently extenſive lawn, which, if it be the firſt thing that ſtrikes the ſight, will have an elegant effect; for ſpacious walks, one of which, ſo contrived as to be perfectly dry, and every now and then to lead to a ſhady place, or into plantations of ſhrubs, where a perſon may walk in private, ſhould ſurround the whole garden, were it only for the benefit of exerciſe. He will have wilderneſſes, groves, green-houſes, &c. and he will be particularly careful to provide plenty of water, for caſcades, fountains, and winding ſtreams, which laſt, if ſo conducted as to imitate nature, will give life and beauty to the whole, beſides being of neceſſary uſe for watering the ground. Statues and vaſes, judiciouſly diſpoſed, are alſo, here, pleaſing and proper objects: but neither theſe, nor any of the buildings in the garden, whether temples, grottos, alcoves, or other, ſhould, by any means, be too much multiplied, or crowded.

Mr. Miller, to whom I again refer for the beſt inſtructions on this head, obſerves very rightly [*], ſpeaking of pleaſure gardens in particular, that the great art of laying them out, is to adapt their ſeveral parts to the natural poſition of the ground, ſo as to have as little earth to remove as poſſible; for this is often one of the greateſt expences in making of gardens: though it may with truth be affirmed, that, wherever it has been practiſed, nine times in ten it has proved for the worſe: ſo that if, inſtead of levelling hills to form large terraces, ſtiff ſlopes, and even parterres, or ſinking of hollows and raiſing of hills, the ſurface of the ground had been only ſmoothed and well turfed, this would have produced a much better effect; and have been more generally approved, than the greateſt number of thoſe gardens which have been made with an infinite expence both of time and of money.

The boundaries of theſe gardens, whatever they are fenced with, ſhould be carefully hid by plantations of flowering ſhrubs, intermixed with laurels and other ever-greens, to conceal the fences, which have a diſagreeable look when they are left naked and expoſed. All the boundaries ſhould not be ſeen from any one point of view: and if the country around affords a variety of pleaſant proſpects, it will be right to bound the pleaſure garden by an ah-ha ditch and wall, to lay open thoſe views.

Neither the huſbandman, nor the country gentleman of moderate fortune, who prefers utility to oſtentatious ſhow, can ſet about an eaſier or more profitable branch of culture, than that of the kitchen and the fruit garden, which may very properly be intermixed, and occupy one and the ſame ſpot of ground, ſince they both require a good, deep ſoil, and nearly the ſame expoſure. The walls which incloſe the kitchen garden, in order to ſecure it's product, will be extremely ſerviceable for fruit: and, if elegance ſhould be ſtudied, this united garden may ſtill be placed out of view from the dwelling houſe.

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[*] *Gardener's Dict.* Art. GARDENS.

The chief things to be conſidered in the choice of a ſpot of ground for a kitchen and fruit garden are, the ſituation, the ſoil, the conveniency of water, the extent moſt proper to be incloſed, and the manner of incloſing it, and laying it out.

If the huſbandman can chooſe his ſoil and ſituation for a garden, the former ſhould be rich, rather ſtiff than light, and conſiderably deep. Nor is a moderate degree of moiſture here by any means an objection. The ſituation ſhould be nearly level: becauſe heavy rains would waſh away the richeſt part of the mould, if the declivity were conſiderable. If he has not a level ſpot near his houſe, the ground intended for the garden may be made into flats with terraces ſupported by ſtrong walls, which will become uſeful for fruit trees. A gentle inclination may be preſerved, to anſwer Mr. Miller's idea of having one part of dry ground for early crops, and the low part for late crops, in order that the kitchen may be the better ſupplied throughout the ſeaſon with the various ſorts of herbs, roots, &c.

He ſhould not be diſcouraged at ſome ſeeming diſadvantages to which his ſoil and ſituation may expoſe him; for no difficulty is ſo great, but that it may be overcome by care, induſtry, and perſeverance. Of this we have a ſtriking inſtance in the following part of a paper which D. J. Beale read to the Royal Society, ſome years ago, with a view to the improvement of gardening in Scotland.

"I had [b] ſeveral times conferences with Sir "Robert Morray (who was an honour to his country and a bleſſing to the place where he abode) "concerning eſculent and olitory gardens, and "(under one) nurſeries of fruit trees, and other "uſeful vegetables in Scotland. I repreſented, "that, almoſt within my memory, they are become the chief relief of England; that auſtere "fruit has been found to yield the ſtrong and "ſprightly liquor which reſembles the wine of the "grape; that the return of gain from gardens is "great and ſpeedy; and that nurſeries are neither "a chargeable nor a burthenſome addition, but a "motive of encouragement to perſevere in the "nobleſt kind of agriculture. Sir Robert granted "all I ſaid: and I am ſure he executed all that "he could for the benefit of his own country, "and of this. But, ſaid he, there are ſo many "rocks, and ſuch bleak winds, in Scotland, that "it can hardly draw in the ſame yoke with "England, for gardens and orchards. I replied, "that, in Devonſhire and Cornwall they fence "their gardens and orchards with Flanders furze "and tall holly, from the ſea-winds; that they have "lofty firs and goodly pines in Scotland; and that "New England, where the winds are as keen, "and the ſnow and froſts as deep, and as long "laſting, as in many parts of Scotland, is never"theleſs full of fruitful orchards. And if Scotland "be farther in the north, yet Norway is rich in "boſcage; and the ſeeds of the hemlock fir, "ſpruce, and cedar, from New England, New"foundland, and Virginia, may perhaps rejoice in "the exchange of Northern America, for the "north of this iſland.

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[b] *Philoſoph. Tranſ. No.* 116.

“ This, I told Sir Robert, I durſt undertake; “ that when Edinburgh and their chief towns and “ univerſities ſhall plant kitchen gardens, as we do “ now in England, they ſhall receive their grate- “ ful reward the firſt year, and bear the charges of “ their nurſeries abundantly, and ſo hold on, and “ within ſeven years ſecure their poſterity of the “ benefit, and delight themſelves with the fruit of “ their pleaſing labour.

“ Now for fertilizing rocks, I made bold to re- “ peat it often, that, within a day's journey of “ the heart of England, I could ſhew three gardens, “ the beſt that I have ſeen for flowery beauties, “ Engliſh ever-greens, and ſallets all the winter “ long; all theſe on a hard-rock, in moſt places “ but one foot deep under earth, in ſome two, “ and in very few three, with very lofty hills “ cloſe to the ſouth ſide, the declivity of the gar- “ dens due north, and the rock perfectly bare next “ to the walls on the north ſide. I likewiſe ſaw rich “ hop yards in the ſame caſe, but in deeper “ ground, next to the garden on the ſouth ſide: “ and theſe northern hopyards eſcaped many blaſts, “ which ſeized on the hop yards on the ſouth ſide “ of the hill. On the ſteep aſcent on the north “ ſide of one of theſe rocky hills, where no “ plough could come, I ſaw a gentleman plowing “ up the ſhallow turf with a hand plough, for “ flax; and I ſaw good flax grow there, to the “ largeneſs of a village-field. His hand plough “ had a ſtem of aſh, or ſally, about ſeven feet “ long, and a plate at one ſide near the end, to “ turn the turf; a coulter to be let out ſhorter or “ longer, to cut the turf four, five, or more inches “ deep, as the land permitted, and a ſmall iron “ wheel. This hand plough the maſter and the “ man, by turns, drove before them with a walk- “ ing ſpeed; having leathern aprons before them,

" to ſave their cloaths. For the cauſes of this " hardy fertility, let philoſophers account. I am " ſure of the truth of what I write.

" It is no hard taſk to ſhovel down the ſhallow " and moſſy turf, from the deepeſt declivities of " rocks, into places where it may have a receptable or ſtay, and there, with the ſpade, to mix " and impregnate it with compoſt for gardens or " vineyards. There too, the tenth part of an acre " in gardening may yield more profit than ten " acres of ordinary tillage in a corn field."

On the other hand, we have many proofs that wet, and even very marſhy, grounds have been converted into excellent kitchen gardens, after they have been drained. Such was, formerly, all that large part of Paris which ſtill retains the name of *le marais* (the marſh); and ſuch were, evidently, ſeveral of our now moſt profitable gardens around London. The Marquis of Turbilly has given us farther inſtances of this truth in ſeveral of his noble improvements before mentioned; and the Memoirs of the truly patriotic Society of Berne remark very juſtly[c], that all legumes and pot-herbs thrive perfectly well in the black, rich, moiſt, and ſomewhat riſing grounds, which moſt commonly ſkirt the borders of marſhes.

As warmth is eſſentially neceſſary to a garden, it is adviſable that the expoſure of the ground intended for this purpoſe be to the ſouth-eaſt, or ſouth; and that it be protected from the north and north eaſt, either by high grounds, or plantations of lofty trees at a ſmall diſtance. — Fruit trees require to be likewiſe protected from the ſouth-weſt and weſt, which are apt, in the autumn, to ſhake the fruit.

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[c] *Obſervations, &c. pour l'année* 1762, *p.* 101.

The huſbandman ſhould here ſpare no trouble or expence to render his ſoil of a proper quality and depth: and if it be not naturally ſo, he muſt have recourſe to one or other of the methods before directed for the improvement of ſoils[d], according to the nature of his ground.

Whatever the ſoil be, the mould in which the plants are to live, and thrive, ſhould be deep enough to afford their roots full room to extend themſelves. It appears by ſeveral experiments related in my ſecond volume, that the roots of many plants, not excepting even annuals, pierce to the depth of eighteen inches, and more. To allow therefore a ſufficiency of room, though perhaps more than may be really wanted, a depth of three feet of good mould ſhould be allotted them here: and if the ſoil underneath is clay, or retentive of water, which would be apt to chill the roots of plants, it will be right to exceed even this depth.

Trenching is the moſt effectual way to obtain a conſiderable depth of well looſened mould. The common method of doing this, when the ſoil underneath is clay, is to begin with digging a trench four or five feet wide, either along or acroſs the whole ground; then to lay in the bottom of it, about half a foot thick, long dung, fern, leaves of trees, rotten ſticks, weeds, or any other ſuch like traſh*, to rot and keep the ſoil from binding; then to fill this up with the earth dug out of the next adjoining trench, laying uppermoſt the ſpits that were loweſt, and ſo to continue till the work is finiſhed, without ever going deeper than juſt to the clay, though the ſurface be never ſo ſhallow. But if the clay be dug into, and part of it be turned up and mixed with the other earth, it's bad qualities will ſoon be corrected by the influences of the air, rain, and one winter's froſts; it will become good and fertile mould, and the depth of the ſtaple will be increaſed thereby, eſpecially with the addition of a little drift ſand, coal, or other aſhes. The beſt time for trenching of land, that it may receive the benefit of being well mellowed, is the beginning of winter; when alſo, being moiſt, it is eaſy to dig.

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[d] See *Vol.* I. *c.* 1.

* But very great care ſhould be taken, that there be not any ſeeds of weeds mixed with it; for they would afterwards be brought up towards the ſurface, grow, and become extremely pernicious.

When the mould on the ſurface is but ſhallow, and lies on a bed of ſand, gravel, or looſe earth, it will be adviſeable to lay a layer of ſtiff earth, inclining to clay, at the bottom of the trench. This will be more eſpecially neceſſary for the growth of trees, or plants whoſe roots naturally pierce deep: for by means of this earth, thoſe roots will ſpread horizontally in the mould, inſtead of ſtriking down, as they would otherwiſe do, into a barren earth, which would immediately make the trees decay and become ſtinted. And another advantage attending this method will be, that as water cannot ſo eaſily deſcend through this ſtiffer ſoil, the earth will be thereby preſerved in a ſo much moiſter ſtate.

The general practice of gardeners is, regularly to trench their ground, and lay it rough in the winter, without ſufficiently conſidering the quality of the ſoil, or the nature of the earth which lies underneath. But a little reflection would convince them of their error. — Let us, in this light, ſee what is the effect of trenching in various ſoils. If the ground is naturally light, and lies on a bed of ſand or gravel, it is to be feared that every ſubſtance brought to improve the ſoll, together with it's fineſt and richeſt particles, will be carried down into that ſand or gravel. Does not too frequent trenching contribute to this loſs? as does likewiſe laying the ſurface rough in the winter: for the rains waſh the finer mould into the hollow places, from whence, the depth of the ſoil being leaſt there, it is moſt readily carried down into the looſe earth underneath. If the ſoil underneath is ſtiff, frequent trenching is proper in order to bring back to the ſurface the rich mould that has been waſhed down: and if it be naturally ſtrong, the laying of it rough in the winter is an advantage, becauſe the winter's froſts will moulder it's tough ſtrong particles.

This method of preparing the ground is, undoubtedly, expenſive; but it's fertility afterwards will yield an ample reward.

Plenty of water is abſolutely neceſſary in this garden, and therefore great care ſhould be taken to provide it, in ſuch manner that it may be come at as eaſily as poſſible. If a ſufficient ſupply of it can be obtained from the neighbouring grounds, two or three baſons ſhould be made in different parts of the garden, if it be a large one; for when the water is to be carried to a conſiderable diſtance, the expence attending this neceſſary buſineſs will be great, and there will be danger of the plants ſuffering for want of it; labourers being very ſparing of their work, eſpecially when it is toilſome, unleſs they are well looked after. The ſize of theſe baſons ſhould be proportioned to the quantity of water that will be wanted, or with which they can be ſupplied: but their depth ſhould not exceed four feet, for fear of accidents, if people ſhould chance to fall into them: beſides which, deep water is not ſo well warmed and tempered by the ſun and air, as when it is ſhallow.

The methods before directed[e] for collecting and preſerving of water in ponds or reſervoirs in the field, are equally applicable to the making and repleniſhing of theſe baſons in the garden. But it will be proper here to add the following more particular cautions and inſtructions of Mr. Miller, who, after obſerving [f], that the beſt time of the year for lining theſe baſons with clay, particularly in looſe or ſandy land, and for afterwards covering that clay with a thick layer of coarſe gravel, is in autumn, when the ſun is declining, and the weather temperate, adviſes, "as a farther means of ſecuring this clay from being cracked by the heat of the ſun, or by froſt, to lay upon the rim or top of it, around the ſides of the baſon, a ſtratum of ſand, then a ſtratum of good earth, and upon this a layer of thick turf. The graſs thus laid will root in the mould underneath, and bind the whole firmly together: and it ſhould be laid as far down the inſide of the baſon, as the water is apt to ſhrink to; that no part of the clay may be wholly expoſed to the weather.

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[e] See *Vol.* III. *p.* 389.

"No trees or ſhrubs ſhould be ſuffered to grow near theſe baſons, leſt their roots ſhould penetrate into them, and thereby occaſion holes through which the water would find an eaſy paſſage. Neither ſhould theſe reſervoirs be made near to tall trees, becauſe the ſhaking of them, by violent winds, would be apt to looſen and crack the clay.

"In countries where clay proper for this purpoſe cannot be eaſily had *, theſe baſons are frequently lined with chalk beaten into fine powder, and made into a ſort of mortar, which is rammed down and worked very hard and firm all over their inſide. This cement holds water very well, if the pond be not ſuffered to remain too long dry: for when this happens, the ſun and wind are apt to crack the chalk, and theſe cracks generally extend through it's whole thickneſs, ſo as to let out the water.

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[f] *Abridgement of the Gardener's Dict.* Art. WATER.

* The true ſign of good clay, ſays Mr. Miller, (meaning particularly clay fit for this uſe,) is, that it be cloſe and firm, without any mixture of ſand, and that it be tenacious and fat in handling. It's colour matters not. *Abridgement of the Gardener's Dict.* Art. WATER.

" Some line theſe ponds with bricks laid in terras, which is a good method where the ground is very looſe and ſandy, becauſe, when theſe walls are well built, the ſurrounding earth may be rammed down cloſe to them, ſo as to prevent it's falling away, or ſettling from them. But, as heat is apt to crack the terras, no part of this lining ſhould be left long dry and expoſed.

" Others again uſe for this purpoſe a cement of powdered tile and lime, two thirds of the former to one third of the latter, beaten well together, and worked up with but little water: for the ſtiffer it is, and the more it has been beaten, the better it will be. With this cement they cover the ſurface of the walls of baſons about two inches thick, laying it very ſmooth, and taking great care that no ſticks, ſtraws, or ſtones be mixed with it. This is generally done in dry weather; and as ſoon as the whole inſide of the baſon has been plaiſtered in this manner, it is rubbed over with oil or bullock's blood, and the water is let in immediately after. This cement has the property of hardening under water, ſo as to be equal to ſtone; and it will continue as long ſound."

Where a ſupply of water for baſons and ponds cannot be obtained, wells muſt be dug, and the water taken out of them ſhould be expoſed to the ſun and air for ſome time, before it is uſed, becauſe ſays Mr. Miller, the rawneſs of this water, when freſh drawn, is not agreeable to the growth of vegetables. —— How far this may have been actually experienced, I cannot ſay. —If by rawneſs, he here means coldneſs, the obſervation may be juſt; becauſe a great degree of cold applied ſuddenly to plants, eſpecially in warm weather, may ſo check the circulation of their juices, as to retard their growth. But if he means by it that hardneſs which is generally found in all well-water, the experiments mentioned in the third volume of this work * ſeem to refute that old, but miſtaken opinion.

The ſize of this garden ſhould be proportioned to the wants of the family; but with a much larger allowance of ground than is uſually allotted, in order that the plants may be benefited by ſtirring the earth between them whilſt they grow. The great and manifeſt advantages of this practice, eſpecially in the culture of pulſe and garden plants, have been ſo evidently ſhewn by numbers of experiments related in the former parts of this work, that I cannot but again recommend it here as an object of high importance.

It ſhould be incloſed with a wall, either of brick or ſtone; but brick is beſt, for the greater conveniency of nailing up the fruit trees which are to be planted againſt it. The thickneſs of theſe walls ſhould be proportioned to their height, which ſome run up to twelve or fourteen feet, or more: but nine or ten will be enough for almoſt any kind of fruit; and in this caſe thirteen inches, that is to ſay, a brick and an half, will be a ſufficient thickneſs; though two bricks will be better, for duration. Their inſide ſhould be built as ſmooth as poſſible, and, to ſtrengthen them againſt high winds, piers ſhould be run up with them, at the diſtance of about twelve or

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* Page 402. 403.

fourteen feet from each other, according to the uſual extent of the fruit trees for which they are intended. As to pears, which ſpread very wide, and frequently grow much above the height here mentioned, they do not require the aſſiſtance of a wall; unleſs it be ſome of the lateſt winter ſorts, and theſe the curious, who will be at the expence, may plant againſt walls built on purpoſe for them. Theſe piers may project ſix or eight inches on the outſide of the wall, for the ſake of greater ſolidity; and they ſhould advance about four inches on the inſide, for the convenience of fixing to them trelliſes, which will be ſpoken of hereafter in the article of fruit gardens.

If the quantity of walling which ſurrounds the kitchen gardens be too little to furniſh the deſired ſupply of fruit, a croſs wall may be built through the middle of this ground; or, where the ſize of the garden will admit of it, there may be two croſs walls: but theſe walls muſt not, by any means, be leſs than eighty or an hundred feet aſunder. More will be yet better.

Mr. Miller[g] is clearly of opinion, that the beſt aſpect for walls, in England, is to have one point to the eaſtward of the ſouth; becauſe theſe will enjoy the benefit of the morning ſun, and be leſs expoſed to the weſt and ſouth-weſt winds (which are very injurious to fruits in this country), than thoſe which are built due ſouth. "I know, ſays "he, that many perſons object to the turning of "the walls the leaſt point to the eaſt, on account "of the blights which they think come from that "quarter in the ſpring: but, from many years "experience and obſervation, I can affirm, that "blights as often attack thoſe walls which are "open to the ſouth weſt, as thoſe which are built

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[g] *Abridgement of the Gardener's Dict.* Art. WALLS.

" to any other aſpect; and I believe thoſe who " will be at the trouble of obſerving for ſeven " years, which aſpected walls ſuffer moſt from " blights, will find thoſe which are built with a " point to the eaſtward of the ſouth, as ſeldom " blighted as thoſe which are turned to any other " aſpect; therefore, in the contrivance of a kitchen " garden, there ſhould be as great a length of " theſe walls built, as the ſituation of the ground " will admit.

" The next beſt aſpect is due ſouth; and the " next to that ſouth-eaſt, which is preferable to " the ſouth weſt, for the reaſons before aſſigned: " but as there will, for the moſt part, be ſouth- " weſt and weſt walls in every garden, theſe " may be planted with fruits which do not " require ſo much heat to ripen them, as thoſe " deſigned for the beſt walls: but wherever there " are north walls, thoſe will only be proper for " baking pears, plums, and morello cherries for " preſerving, or ſome duke cherries may be " planted againſt theſe walls, to ſupply the table " till peaches, nectarines, and plums are ripe."

In whatever manner the walls are made, this garden ſhould be well ſheltered from the north and north-eaſt, by a diſtant plantation of high timber trees, if nature has not otherwiſe provided a ſufficient defence from thoſe quarters.

In the diſtribution of this garden, particular care ſhould be taken to lay the walks out ſo as to obtain the greateſt convenience that can be for ſupplying each part of it with manure and water, and as eaſy acceſs as poſſible to it's different quarters, which may be ſurrounded by a border planted with eſpaliers. The manner of forming eſpaliers will be directed when I come to ſpeak of the training of fruit trees.

Theſe walks ſhould be firm enough to bear at leaſt the weight of a loaded wheel-barrow, and wide enough for the convenient carriage of whatever there may be occaſion to bring into this garden, or to carry out of it. Mr. Miller is againſt making them of gravel; becauſe, as it will very often be neceſſary to wheel manure, water, &c. upon them, they would ſoon be torn up and rendered unſightly. For the ſame reaſon he rightly condemns turf walks here, and adviſes, as the beſt for a kitchen garden, thoſe which are laid with a binding ſand. In effect, theſe are the eaſieſt kept of any: for when either weeds or moſs begin to grow, ſcuffling of them over with a Dutch hoe in dry weather, and raking them over a day or two after, will render them as clean as when they were firſt laid:—or if they are covered with duſt taken from great roads, this will bind and become very firm.

If the ſoil is ſtiff and apt to retain water, narrow under ground drains ſhould be made by the ſides of the walks, to carry off that wet: and where the ground is naturally moiſt, lime rubbiſh, flints, chalk, or any other ſuch material as can be procured with the leaſt expence, ſhould be laid at the bottom of theſe walks; or if neither of theſe can be had, the ſand ſhould be laid thick upon a bed of heath or furze, and the water will drain through this, ſo that the walks will be firm and good in all ſeaſons.

The ſame means will alſo help greatly to drain away the ſuperfluous moiſture of the whole ground, if the ſoil ſhould be naturally too wet; or, if they are not ſufficient, more under-ground drains may be made acroſs different parts of the garden, according to it's declivity: for moſt kitchen plants are hurt by too much moiſture in winter, and trees never produce good fruit when their roots lie in water.

If each quarter of the kitchen garden is to be encompaſſed by eſpaliers, the walks which divide thoſe quarters ſhould be wide enough to afford admittance to the warmth of the ſun, and to a free current of air. In this caſe they may be, as Mr. Miller directs, ſix feet wide in ſmall gardens, and ten or twelve in extenſive grounds. On each ſide of theſe walks, the eſpalier ſhould be planted in a border four or five feet wide; by which means the two eſpaliers will be far enough aſunder for their roots never to injure one another. Theſe borders may be ſown with ſmall ſalletting, or any other herbs that do not continue long or root deep; ſo that no ground need be loſt, and the continual ſtirring and manuring of it for theſe productions will be of great ſervice to the roots of the trees.

The borders along the ſouth and other walls which have a good expoſure, ſhould, in the opinion of this experienced gardener, be at leaſt eight or ten feet wide, in order to allow the roots of the fruit trees that are planted againſt them full room to extend themſelves. Such of theſe as face the ſouth may be ſown for early crops of plants which do not root deep, and thoſe that are expoſed to the north will do for late crops: but no deep rooting plant, eſpecially peas and beans, ſhould ever be placed too near the trees; though moſt gardeners are apt to tranſgreſs greatly in this reſpect, as well to preſerve their crops in winter, as to bring them forward in the ſpring: both which ends might be anſwered equally well, and without prejudice to their fruit trees, by making reed hedges in ſome of the warmeſt quarters, and ſowing cloſe to them their early peas, beans, &c.

It is a general opinion, that plants which are ſheltered by walls, ſo as to be defended from nipping winds, and to have the additional warmth of the reflected heat of the wall, are leaſt liable to be deſtroyed by the winter's froſts; for which reaſon it is that early crops are moſt commonly ſown in borders ſo ſituated. — The ſun will undoubtedly give greater motion to the ſap of plants there, and they may, for this reaſon, ſeem to be the ſtronger. But if we conſider, that the walls yield no protection againſt the ſeverity of the night's froſt, and that the effect of this froſt muſt be moſt ſeverely felt by plants whoſe ſap is in the greateſt motion; we may rather fear that this ſituation, inſtead of being beneficial, may, in fact, counter-act the very end propoſed.—To be ſatisfied of this fact, a friend of mine ſowed ſome early peas in a border at the foot of a ſouth wall, and at the ſame time ſome others, of the ſame ſort, in an open field adjacent to the garden; and he found that the latter were by much the leaſt damaged by the winter's froſts; nor did he perceive any great difference in the ſeaſon of their blooming.

A ſquare, or an oblong form, will be moſt agreeable to the eye: but it matters not, in other reſpects, what ſhape this garden is of; eſpecially as all groſs irregularities may eaſily be hid in the laying of it out. Thus, when this is done, any of the ſlips cut off by the garden wall, may, if large enough, and well expoſed to the ſun, be ſet apart for a place to make hot-beds for early cucumbers, melons, &c. One would wiſh this ſpot to be as near as poſſible to the ſtables, for the convenience of ſupplying it with dung; and to have it without the wall is certainly moſt eligible, becauſe that will ſave a great deal of filth and litter in the garden, and remove from the noſe and eye an object which is not of the moſt pleaſing kind. If this ſlip is long enough to admit of an annual ſucceſſion of new beds during two or three years, they will be much better than when they are continued more than one year on the ſame ſpot: and as it will be abſolutely neceſſary to fence this melon ground, as 'tis called, round with a reed hedge, this may be ſo contrived as to be moved away in pannels, in ſuch manner that there will be no occaſion to ſhift any thing more than one of the croſs partitions, or fences, each year.

The importance of the precept, particularly here, will juſtify my mentioning again, that the dunghills ſet apart for this, or for any other purpoſe of gardening, or agriculture, ſhould be carefully kept clear from weeds: for if weeds are ſuffered to ſcatter their ſeeds upon the dung, they will be brought into the garden, or other cultivated ground, ſhoot up, damage every crop of uſeful plants, and occaſion a perpetual labour to extirpate them.

Another caution which Mr. Miller gives, as abſolutely neceſſary to be obſerved, is, to carry off all the refuſe leaves and ſtumps of cabbages, the ſtalks of beans, and haulm of peas, as ſoon as they have done bearing; becauſe the ill ſcent which moſt people complain of in kitchen gardens, is wholly occaſioned by theſe things being ſuffered to rot upon the ground. The leaves of the cabbages may be given to hogs, or other animals, while they are freſh, and the reſt of this traſh may be thrown upon the dungill, which it will help to enrich.

I muſt here point out a too common neglect of moſt gardeners, which is, the letting of their plants remain on the ground till they have ripened their ſeeds, and wither; not conſidering that whilſt a plant is full of ſap, it preſerves the earth in a looſe ſtate, probably by means of the moiſture perſpired from it's roots; but that, when permitted to ſtand till it's ſeed is ripe, or the plant withers, it then leaves the impoveriſhed earth dry and hard; being itſelf become entirely void of ſap.

The moſt important points of general culture here conſiſt in good digging, keeping the ground clean, manuring the ſoil, and allowing proper diſtances between the plants, according to their ſeveral kinds and growths. But as the various productions of the kitchen, and thoſe of the fruit, garden require very different treatment, though in the ſame incloſure; it will now be right to conſider them ſeparately.

## SECT. I.

### OF THE KITCHEN GARDEN.

THIS, if it be rightly managed, is the moſt uſeful and moſt profitable ſpot of ground that either the country gentleman, or the huſbandman, can cultivate. It is indiſpenſably neceſſary to every family in the country, where, the neareſt market town being frequently far off, but poorly furniſhed with plants and roots, and that only on certain ſtated days, perhaps not oftener than once a week, there is no other way to have a variety, or even a ſufficiency, of this exceedingly healthful food, one of whoſe great excellencies conſiſts in it's being freſh gathered.

Two eſſential rules to be obſerved in the general management of a kitchen garden are, never to crowd the ground with more plants than it is able to nouriſh properly; and never to let any part of it remain unoccupied, for want of a due ſucceſſion of crops. By this means the maſter, whom I would adviſe always to be his own gardener, at leaſt ſo far as perſonally to direct and ſuperintend whatever is done, may have his table conſtantly ſupplied with ſuch vegetables as he likes beſt, no part of his ground will lie uſeleſs, and each of it's products will be brought to perfection.

The common practice is, not to dig deeper than from nine to twelve inches, except when the ground is trenched: But the great ſucceſs of M. de Chateauvieux's experiments, related in the former parts of this work, ſhews that it ought to be well looſened to the depth of at leaſt eighteen or twenty inches, as his generally was; becauſe all plants are ſingularly benefited by having a good depth of mould to grow in. The ſame experiments, confirmed by very many others, have likewiſe demonſtrated, that their flavour is highly improved, and their ſize greatly increaſed, by ſtirring of the earth around them whilſt they grow. This is particularly remarkable in plants which are ſown early, and remain long in, or on, the ground, ſuch as carrots, cabbages, &c. for which this culture ſhould be repeated three times, at proper ſeaſons, as before directed[a]; with this difference only, that what is done with a plough in the field, muſt here be performed with a ſpade. But in order to enjoy the full advantages of this method, the plants muſt be ſown, or ſet, in beds, either in ſingle or double rows, according to their ſize; and theſe rows muſt be at ſuch diſtance from each other, as to allow ſufficient room for digging between them.

To avoid the tedious prolixity, and numerous repetitions, which would be the neceſſary conſequence of giving a ſeparate account of the culture of each particular plant proper for the kitchen garden; I ſhall claſs together (for it is not my buſineſs here to make botanical diſtinctions) thoſe which require the ſame, or nearly the ſame, treatment; and then, enumerating them alphabetically, for the greater convenience of the reader, point out wherein any of them are bettered by a different management. The general heads under which I ſhall range them, are, 1, Thoſe which are cultivated for their roots, whether of the tap, or of the bulbous kind. 2, Such as are cultivated for their tender ſhoots, heads, or leaves. 3, Legumes. 4, Salleting. 5, The ſorts commonly diſtinguiſhed by the appellation of ſweet-herbs; and 6, thoſe that are raiſed in hot-beds.

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[a] See *Vol.* III. *Part* 3. *c.* 1. *p.* 149. *et ſeqq.*

## *ARTICLE* I.

### *Of Roots*

### *proper for the Kitchen Garden.*

BEET, whether white or red, ſhould be ſown in March, in a deep and light ſoil. The former is cultivated for it's leaves only, and will therefore be mentioned again in the next article. The latter is eſteemed for it's root, which, when boiled, cold, and cut into thin ſlices, makes a grateful mixture with winter ſallets. The reddeſt and largeſt roots are the tendereſt and moſt eſteemed: conſequently the principles of the new huſbandry are extremely applicable to this plant; and we have accordingly ſeen[b] that M. de Chateauvieux had beet roots managed this way, which meaſured from five to ſixteen inches in diameter towards their top, or thickeſt part, though raiſed in a common field, and cultivated only with a horſe-hoe.

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[b] *Vol.* III. *p.* 176.

Their uſual culture in the garden is, to hoe the ground carefully when the plants have put out four leaves, to cut up all weeds, and to thin the plants till they ſtand ten or twelve inches aſunder. In three weeks or a month more, the hoeing and weeding ſhould be repeated; and in ſix weeks after this, the ground ſhould be hoed over a third time, and the plants of the red beet, of which I now ſpeak, ſhould be thinned again till they are eighteen inches from each other, if it be intended that they ſhould grow to the largeſt ſize. This is generally the laſt hoeing beſtowed upon them; for their leaves, which are then large, ſoon ſpread ſo as to cover the whole ground, and effectually keep under any weeds that may afterwards ſpring up. Theſe leaves are moſt commonly of a deep green, or purple colour.

Inſtead of this method of cultivating beet, I am ſufficiently warranted by M. de Chateauvieux's ſucceſs [c], to recommend ſowing them in rows, in which they ſhould ſtand fourteen or fifteen inches aſunder in the row, and inſtead of the hoeings before mentioned, to dig the ground between the rows at leaſt a ſpade deep, as often as weeds appear, or in proportion to the greater dryneſs of the weather; for, though it may ſeem a paradox to ſome of my readers, every inſtance of M. de Chateauvieux's practice proves, that even in the greateſt droughts, each ſtirring of the earth with the horſe-hoe, gave freſh vigour to the plants.

The beet roots will be fit for uſe in autumn, and will continue good all the winter: but they will begin to grow hard and ſtringy in the ſpring, when they will begin to ſhoot. The ſeeds of this plant, by which only it is propagated, ripen about the end of Auguſt, or in the beginning of September. They are round, rough, and about the bigneſs of a middling pea. To obtain them in perfection, ſome of the fineſt roots that have been preſerved from the winter's froſts are replanted in March, and let run up to ſeed. The kitchen gardeners about London, in order to ſave ground, frequently ſow the red beet with carrots, parſneps, or onions, and afterwards draw up their carrots and onions when they are young, to make room for the growth of the beet. But unleſs they pull them up very young indeed, it is much better to ſow the beet ſeparately.

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[c] See *Vol.* III. *p.* 175.

*Carrots* delight in a warm, light ſoil, which ſhould be dug very fine to the depth of at leaſt two ſpades; becauſe they are very apt to grow forked, and to ſhoot out lateral roots, if they meet with any obſtruction. Dung, if it be not very thoroughly rotted, will make them do the ſame, and alſo occaſion their being worm-eaten: for which reaſon it is beſt not to dung the ground the ſame year that it is ſowed with carrots; eſpecially as all the experiments in the new huſbandry, and particularly thoſe of M. de Chateauvieux in relation to this plant [d], prove that good culture will, alone, produce much finer and better taſted roots. However, if dung is uſed, great care ſhould be taken to break and divide it's parts as much as poſſible.

Thoſe who are fond of young carrots may ſow a ſucceſſion of crops in their garden, at any time between the beginning of January, if the weather be open, to the end of March. For the very early crops, they ſhould ſow in warm borders, under walls, pales, or hedges, but not quite cloſe thereto, leſt the young plants ſhould be drawn up ſo as not to form tolerable roots. The breadth of about a foot, between the carrots and the fence,

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[d] *Vol.* III. *p.* 176.

may be ſown with lettuces, or any other young ſalletting.

March is the ſeaſon to ſow carrots for a full crop. April and May are not accounted proper months for this ſowing, becauſe, if the weather ſhould prove hot and dry, the plants will run up to ſeed before their roots have any bulk. Seeds ſown in July will produce an autumnal crop; and at the end of Auguſt others may be ſown to ſtand through the winter, and yield early carrots in March, before thoſe of the ſpring ſowing will be fit to draw: but they will often be tough and ſticky, and ſeldom well taſted—— The red, or orange carrot, as it is called, is preferred to the yellow.

It is pretty difficult to ſow carrot ſeeds equally, ſo as to prevent their coming up in patches; firſt, becauſe they are very apt to cling together; and ſecondly, becauſe they are ſo light, that a little wind at the time of ſowing, eaſily baffles all the gardener's care. To remedy the former of theſe inconveniencies, they ſhould be mixed and well rubbed with dry ſand, which will ſeparate them [c]; and to guard againſt the latter, a calm day ſhould be choſen. They ſhould then be ſown on well pulveriſed ground, laid as even as poſſible, to prevent their falling together into hollows; and immediately after this, the mould ſhould be trodden pretty cloſe, to bury them. That done, it ſhould be ſmoothed with a rake. They ſeldom come up in leſs than five or ſix weeks. The manner of cultivating them whilſt they grow, is the ſame as before directed for beet roots; like which they are amazingly benefited by digging and turning up the earth between them, to the depth of a ſpade is beſt, inſtead of only ſcratching it's ſurface with a hoe, as is the common way. If they are to be drawn young, five or ſix inches may be a ſufficient diſtance between them: but if they are to grow large before they are pulled up, they ſhould be eight or ten inches aſunder every way: and in this caſe they ſhould be thinned accordingly at their firſt hoeing; for plants which have been ſtinted or cramped in their early growth, never recover their full ſtrength.

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[c] See *Vol.* III. *p.* 174.

No other crop, if we perhaps except parſneps, which require exactly the ſame culture, ſhould be ſown with the carrots; becauſe, if all the ſeeds grow, what one ſort gains, muſt be loſt by another. Leeks, onions, radiſhes, &c. ſhould therefore be excluded here; though many of the kitchen gardeners near London ſtill continue to ſow them all together.

The way to preſerve carrots for uſe during the winter and ſpring, together with the beſt method of obtaining, gathering, and keeping their ſeeds, have been directed in my third volume [f], and therefore need not be repeated here.

*Eſchallots* are propagated by parting the cloves or offsets of their roots, and planting them in a light ſoil; for though they will grow in almoſt any ground, they will increaſe moſt plentifully there. The beſt time for ſetting them is towards the end of January. They muſt be taken up as ſoon as their leaves begin to wither; or they will rot if left long after in the ground.

*Garlick* is likewiſe propagated eaſily by ſeparating the cloves or ſmall bulbs of it's root, and planting them, in the ſpring, about four or five inches aſunder. They too will thrive in almoſt any ſoil or ſituation: but their increaſe will be ſurpriſing in rich ground. About the beginning of June, their leaves ſhould be tied in knots, to prevent their ſpindling or running to ſeed: and this will alſo greatly enlarge their bulbs. As ſoon as their leaves begin to wither and decay, which will be about the middle of July, the roots ſhould be taken up, and kept dry for uſe.

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[f] *Page* 176.

If this plant is propagated by ſeeds, theſe may be ſown in a border of common earth, either in autumn ſoon after they are ripe, or in the enſuing ſpring: They will ſoon come up, and require no farther care, but to keep them clear from weeds; for every ſpecies of garlick is very hardy. In the following autumn, the plants thus raiſed may be tranſplanted into the borders where they are to remain.

*Horſe-radiſh* will thrive beſt in a rich ſoil which has been trenched at leaſt two feet deep: more will be better, if the ſtaple permits. It is propagated by offsets which have a bud upon the crown, or by replanting the tops of the old roots that have been dug up for uſe: no matter how ſhort they are, provided they have a bud. October and February, the former for dry lands, and the latter for moiſt, are the proper ſeaſons for planting theſe cuttings or offsets, which is done by placing them about four or five inches aſunder, with the bud upward, in a trench ten inches deep, and then covering them with the mould taken out of that trench. With this management only, and keeping the ground clear from weeds till the plants are ſtrong enough to maſter them, the roots of the horſe-radiſh will grow long, and ſtrait, and will be fit for uſe the ſecond year.

*Jeruſalem Artichokes* are propagated by planting the ſmaller roots, or the larger ones cut into pieces with an eye or bud to each piece, either in the ſpring or autumn, at a good diſtance from each other, in almoſt any ſoil that is but tolerably deep. Theſe roots will multiply greatly;

and in the autumn following, when their ſtems decay, they may be taken up for uſe. It is beſt to ſet them in a remote corner of the garden, becauſe they are very unſightly while growing, and their roots are apt to over-run every plant around them: nor is it eaſy to deſtroy them after they have once taken poſſeſſion of the ground. The Jeruſalem artichoke (*Helianthus*) is a ſpecies of the ſun flower. It is a watery root, and very apt to engender wind; for which reaſon it is little eſteemed.

*Leeks* are raiſed by ſowing their ſeeds in the ſpring, in the ſame manner as onions, with which they are commonly mixed, and ſown at the ſame time, in ſuch proportion as is deſired of either ſort. The onions are by much the quickeſt growers: but if they are taken off the ground in July, as they generally are, the leeks will afterwards have ſufficient time to grow large; ſo that there may, properly enough, be a moderate crop of each on the ſame ground: for their culture is exactly ſimilar. I ſhall give the particulars of it in the article *Onions*; and only obſerve here, that ſome perſons ſow their leeks in beds in the ſpring; and in June, after ſome of their early crops are taken off, they dig up the ground on which they ſtood, and plant their leeks out there, in rows a foot aſunder, and ſix inches from each other in the rows; obſerving to water them till they have taken root; after which they will require no farther culture, but keeping the ground free from weeds. This is a very good method for perſons who have but little room: for the leeks thus planted will grow to an extraordinary ſize.

To ſave the ſeeds of this plant, which does not ſpindle till the ſecond year, ſome of the fineſt and largeſt leeks, marked out for this purpoſe, muſt be let remain in the place where they grow until

February, when they ſhould be tranſplanted in a row againſt a warm hedge, pale, or wall, at the diſtance of about eight inches aſunder; and when their ſtems run up, they ſhould be ſupported by a ſtring ſtretched horizontally along them, to prevent their being broken down, to which they are very liable, eſpecially when in head. The cloſer they are drawn to the fence, at the end of the ſummer, or in autumn, the better their ſeeds will ripen; which is of ſo much the greater conſequence, as they ſometimes do not perfect them in this country in cold ſummers or autumns, but are entirely ſpoiled by early froſts.

When the heads turn brown, which is a mark that the ſeeds are ripe, they ſhould be cut off, with about a foot of the ſtalk to each, then tied in bundles of three or four heads, and hung up in a dry place, till Chriſtmas or after, when the ſeeds may be threſhed out for uſe. This, indeed, is not eaſy, on account of the toughneſs of their huſks: but rubbing them hard againſt rough tiles will break thoſe huſks, and get the ſeeds out better than perhaps any other method.

*Onions* intended for the general winter crop ſhould be ſown in the latter end of February, or beginning of March, on rich light ground, well dug and levelled, and cleared from the roots of all weeds. The weather ſhould be dry, and the ſurface of the ground not moiſt, at the time of ſowing. The common allowance of ſeed is after the rate of ſix pounds to an acre of land: but the generality of gardeners ſow more, in order to allow for drawing out a crop which they call cullings. However they ought not to be ſown too thick.

The way of ſowing theſe ſeeds alone in the garden is, to ſtrew them as equally as poſſible over the ground intended for them, then to tread or beat it down flat, in order to fix them in their places, and as ſoon as they begin to ſhoot, to ſift a little fine earth over them, to the thickneſs of ſomewhat leſs than a finger's breadth: for they muſt not be buried deep.

In about ſix weeks from the time of ſowing, the onions will be forward enough to be hoed. This ſhould be done in dry weather, with a hoe about two inches and an half wide; carefully cutting up all weeds, and thinning the plants themſelves till they ſtand at leaſt two or three inches aſunder. In about a month after, they muſt be hoed again, and thinned till they are four or five inches from each other; and in about a month or ſix weeks more, they muſt be hoed for the third and laſt time, and thinned to the diſtance of at leaſt ſix inches.—If this hoeing (which may be performed with a wider hoe, for the ſake of greater riddance,) be well executed, and the weather proves dry, the ground will remain clean till the onions are fit to pull up, which will generally be toward the middle of Auguſt. But if the ſeaſon be wet, a careful perſon ſhould go over the ground, about a fortnight or three weeks after this laſt hoeing, and pluck up by hand all weeds that may chance to have taken freſh root, or to have ſprung up ſince the former clearing: for the onions ſhould not be diſturbed with a hoe after they have begun to bulb.

Onions have attained their full growth when their blades fall to the ground, and ſhrink: but before their necks are withered off, the bulbs ſhould be taken up, and, after cutting off the extremity of their leaves, be ſpread upon a dry ſpot of ground, and there turned every other day at leaſt, to accelerate their drying, and prevent their taking freſh root; which laſt they will otherwiſe quickly do, eſpecially in moiſt weather. With this management, they will be fit to houſe in about a fortnight. But at the time of hoeing them, which ſhould be done in perfectly dry weather, particular care ſhould be taken to rub off all remaining earth, to ſeparate the faulty roots, which would ſoon decay and ſpoil the reſt, and not to lay them up in too thick heaps, leſt this ſhould make them ſweat, and conſequently rot. A loſt, or garret, is therefore preferable to a lower room, or ground floor, for keeping them in; and the leſs they are expoſed to the air, the better they will be preſerved. It will be right here to look them over at leaſt once a month, and to pick out all ſuch as are found to be decaying: though, with all the care that can poſſibly be taken, many of them will ſprout in the loſt, eſpecially in mild winters, which are generally moiſt, unleſs their roots have been ſlightly ſinged with a hot iron. This indeed, will effectually prevent their growing: but great caution muſt be uſed not to ſcorch the pulp of the onions; for that would ſoon deſtroy them.

To ſave the ſeeds of onions, ſome of the firmeſt, largeſt, and beſt ſhaped bulbs ſhould be replanted, in the beginning of March, in well dug beds of fine good mould, about three feet wide, and two feet aſunder. Each of theſe beds will conſequently be wide enough to contain four rows of plants, at the diſtance of near a foot from each other. To make theſe rows, a channel, for each, ſhould be opened all along the bed, to the depth of about ſix inches, and the onions intended for ſeed ſhould be placed therein, with their roots downward, at about nine inches aſunder. They ſhould then be covered, by raking the ground ſmooth, and in about a month's time their leaves will appear. Many of theſe roots will produce three or four ſtalks. Care muſt be taken to keep them clear from weeds; and towards the beginning of June, when the heads of the flowers begin to ſhew themſelves upon the tops of the ſtalks, ſtakes, about four feet long, ſhould be fixed in the ground, at ſuch diſtances that ſtrings may be faſtened from one to t'other, ſo as to ſupport thoſe heads, which would otherwiſe ſoon be broken down by wind and rain, or even by their own weight. Theſe ſtrings ſhould therefore run cloſe under the heads that are to be ſupported by them.

About the end of Auguſt, the heads of the onions will turn brown, and the cells which contain the ſeeds will begin to open. This is a ſure ſign of their being ripe, and no time ſhould then be loſt to cut them, leſt they ſhould fall to the ground. The heads thus cut ſhould be immediately ſpread upon coarſe cloths, and expoſed to the ſun: but they ſhould be ſheltered at night, and alſo in wet weather. When they are quite dry, the ſeeds muſt be beaten out, which is very eaſily done, and after clearing them from their huſks, &c. and expoſing them again to the ſun, for one day, to complete their drying, they may be put up in bags, and kept for uſe.

The Spaniſh onion is moſt eſteemed for it's mildneſs as well as ſize; but it ſoon degenerates in this country. The next place is given to the Straſburgh, and the third to the white, ſometimes called the Egyptian, which is the ſpecies that furniſhes the general winter crop, of which only I have hitherto ſpoken. But the gardeners about London generally raiſe two other crops from this ſame ſort. One of theſe crops, known by the name of Michaelmas onions, is ſown in Auguſt, and ſupplies the markets after the winter onions are over: the other is ſown in the ſpring, and is drawn up for ſallets, after the Michaelmas onions are grown too large for that purpoſe.

For what concerns the Welch onion, or ciboule, the ſcallion, and cives, ſee the article *Salletting*.

The beſt full grown onions are, the largeſt, roundeſt, whiteſt, and thinneſt ſkinned.

As a proof that the ſize of onions may be greatly increaſed by ſtirring the ground around them whilſt they grow (for which purpoſe they muſt ſtand pretty far aſunder), I cannot but mention here, what M. Duhamel relates[g] of one of his correſpondents, M. Barbuat, M. D. who in the year 1755, having ſowed onions in February, and accidentally neglected them till the middle of May, found them quite choaked with weeds. He ordered theſe weeds to be pulled up, and, contrary to the advice of all the gardeners near him, gave the ground in which his onions were two deep ſtirrings. Moſt of them grew to four and four and an half inches in diameter.

*Parſneps* require a rich, mellow, and deep ſoil; in order that their roots, according to the bigneſs and length of which they are eſteemed, may have full room to thicken and run downward. The ſeeds of theſe plants ſhould be ſown in February or March, either alone, or with carrots, eſpecially if it be intended to draw theſe laſt very young; becauſe parſneps ſeldom ſpread much before the latter end of ſummer, by which time the carrots will, in this caſe, be gone. The practice of thoſe gardeners who ſow leeks, onions, and lettuces with their parſneps, is very wrong; becauſe ſo many different growths muſt impoveriſh one another.

The young parſneps muſt be hoed and weeded, or, if they were ſown in rows, the ground between thoſe rows muſt be dug, three or four times in the ſpring, or whenever elſe many weeds appear. By the latter end of the ſummer, their leaves will cover the ground, and prevent the farther growth of weeds; ſo that they will not require any more care after that ſeaſon.

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[g] *Culture des Terres, Tom.* V. *p.* 252.

When their leaves begin to decay, their roots may be dug up for uſe: but they are ſeldom well taſted before that time; nor are they good for much late in the ſpring, after they have ſhot out again. They, therefore, who would preſerve them for ſpring uſe, ſhould dig them up in the beginning of February, and bury them in ſand in a dry place, where they will remain good until the middle of April, or later.

To ſave the ſeeds of this plant in the moſt advantageous way, ſome of the longeſt, ſtraiteſt, and largeſt roots, ſhould be ſingled out, and planted about two feet aſunder, in a place where they will be defended from the ſtrong ſouth and weſt winds: for the ſtems of the parſneps generally grow to a great height, and are very apt to be broken by ſtrong guſts of wind, if they are expoſed thereto. This ground ſhould alſo be kept clear from weeds; and if the ſeaſon ſhould prove dry, watering of theſe plants moderately, twice a week, will increaſe the quantity, and improve the quality, of their ſeeds, which will be ripe about the end of Auguſt or beginning of September, when the heads ſhould be carefully cut off, and ſpread upon a coarſe cloth for two or three days, to dry. The ſeeds ſhould then be beaten off, and put up for uſe. But neither theſe, nor carrot ſeeds, ſhould be depended on after they are above a year old.

*Potatoe.* The culture of this plant, which is in all reſpects fitter for the field, than for the garden, has been treated of ſo very fully in the preceding volume of this work, that I cannot do better than refer the reader to the directions there given; eſpecially as they are equally applicable to the field, and to the kitchen garden[h].

*Radiſhes* are ſown in different ſeaſons, according to the time when they are deſired for uſe. Thoſe ſown in September will be fit to eat at Chriſtmas, if they are not deſtroyed by froſt: but they muſt be uſed whilſt very young, for they ſoon grow hot and ſticky. If ſown towards the end of October, which is commonly the time of ſowing for the earlieſt crops, they will be fit for the table in the beginning of March. Thoſe ſown at Chriſtmas, if the ſeaſon is mild, and the ground in good order, will, if they eſcape the froſt, be fit for eating about the end of March or beginning of April; and by continuing the ſowing once a fortnight, from the middle of January till the beginning of April, always obſerving to ſow the earlieſt crop in the warmeſt and beſt ſheltered ſituations, and the later ones in a moiſt ſoil and open ſituation, without which they will run up, and grow ſticky, before they are fit for uſe, a regular ſucceſſion of theſe roots may be had throughout the ſeaſon. The tendereſt, and mildeſt to the taſte, are thoſe which have been raiſed in deep, rich, and light mould.

When the radiſhes are come up, and have got five or ſix leaves, they muſt be thinned wherever they ſtand too cloſe; for otherwiſe they will run up in tops, and not increaſe in their roots. Some thin them by hand; but it is much better to uſe a ſmall hoe, which will ſtir the ground, deſtroy the weeds, and promote the growth of the young plants. They may be left about three inches aſunder, if they are intended for drawing up ſmall; but ſix inches will be little enough, if they are to ſtand till they are pretty large.

The kitchen gardeners about London, who pay great prices for their ground, and therefore are obliged to make it produce as many crops as poſſible in the year, ſow carrot ſeed with their early radiſhes, in order that, if the radiſhes are killed ſoon after their coming up, as they ſometimes are, the carrots may remain; for the ſeeds of theſe laſt generally lie in the ground five or ſix weeks before they grow, while thoſe of the radiſhes ſprout in about a fortnight: but when both crops ſucceed, the radiſhes muſt be pulled up while very young; or they will weaken the carrots ſo that theſe laſt will not be able to ſupport themſelves after the former are gone.

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[h] See *Vol.* III. *p.* 182—191.

It is alſo the conſtant practice of theſe induſtrious and intelligent men, to ſow ſpinage with their latter crop of radiſhes: for after the radiſhes are taken off, and the ground has been cleared between the plants of ſpinage, theſe laſt will grow ſo prodigiouſly as to cover the whole ſpace in a fortnight's time: and if this ſpinage is of the broad leaved kind, it will be larger and fairer than it uſually is when ſown alone; becauſe moſt people are apt to ſow it too thick, when they do not mix it with any other crop.

The ſmall topped, the deep red, the ſcarlet, and the long topped ſtriped radiſh, are the varieties generally cultivated in kitchen gardens. The ſmall topped is moſt commonly preferred, becauſe it takes up the leaſt room: but a ſmall ſpot of ground will furniſh, from each ſowing, as many radiſhes of any kind as can be ſpent in a family while they are good.

The Naples radiſh, which has a very white, round, ſmall, and ſweet root, may be propagated in the ſame manner as the common ſort, excepting that it ſhould not be ſown till the beginning of March, and the plants ſhould be allowed a greater diſtance. It is not very common in this country; and, indeed, it's ſeeds are apt to degenerate here.

The white and the black Spaniſh radiſhes will be fit for the table by the end of Auguſt, or the beginning of September, if they are ſown about the middle of July, or a little earlier, and will continue good till the froſt ſpoils them. Theſe ſhould be thinned to a much greater diſtance than any other ſort: for their roots will grow as big as common turneps. If they are drawn out of the ground before a hard froſt comes on, and laid up in dry ſand, in the ſame manner as is practiſed for carrots, they will keep good all the winter.

To ſave the ſeeds of radiſhes, ſome of the ſtraiteſt and beſt coloured roots ſhould be planted in rows three feet aſunder, and at the diſtance of two feet from each other in the rows, in deep and well dug ground. If the ſeaſon is dry, they muſt be watered from time to time till they have taken root, after which they require no farther care but keeping them clear from weeds; nor need theſe be feared after the branching ſeedſtalks of the radiſhes have over-ſpread the ground, as they will ſoon do, in ſuch manner as to prevent their father growth.

In this tranſplanting of the radiſhes, an allowance ſhould always be made for bad ſeaſons; becauſe the very ſame plants will not yield a fourth part of the quantity of ſeeds in dry ſeaſons, that they would do in a moiſt ſeaſon.

When the ſeed begins to ripen, it ſhould be carefully guarded from birds; and when it is ripe (which is known by the pods turning brown), it ſhould be cut, dried in the ſun, threſhed out, and laid up in a place where mice cannot come at it.

*Rocambole* is cultivated in the ſame manner as garlick, of which it is a ſpecies. The only difference between them is, that beſides the cloves of which it's root conſiſts, it bears at the top of it's ſtem a head compoſed of many ſmall bulbs, about as big as large peas, and theſe, which are it's ſeeds, are the part uſed in the kitchen. It is propagated either from them, or by parting it's roots. Theſe heads ſhould be kept dry after they are gathered.

*Scorzonera*, commonly called viper's graſs, ſhould be ſown about half an inch deep, in light ground. The beſt time for this ſowing is the beginning of April; and the beſt method, in rows ſufficiently diſtant to leave room for digging the earth between them: for this will greatly increaſe the bulk of the roots, for which only ſcorzoneras are cultivated These roots are of the tap kind, about the thickneſs of a man's finger, brown without, white within, and full of a milky juice. They are accounted very wholſome, nouriſhing, and much more delicate than either parſneps or ſkirrets.

When the plants are come up, they ſhould be thinned to the diſtance of at leaſt ſix inches from each other in the rows, and kept clear from weeds, by hoeings repeated as often as may be neceſſary. Their roots may be taken up when the leaves begin to decay, for they have then done growing, and theſe may be preſerved all the winter in dry ſand: or they may be left in the ground till ſpring, and dug up as they are wanted: but thoſe which remain in the earth after February, will ſhoot up their flower-ſtems, and become ſtrong and ſticky.

Sowing them in drills is far preferable to the common practice of ſowing them in broad caſt, and afterwards tranſplanting them into rows; becauſe, if their roots are broken, they never after grow ſtrait, or long, but ſhoot out into many forked ſmall roots, unfit for uſe.

To ſave the ſeeds of theſe plants, ſome of the faireſt ſhould be let remain where they were ſown. They will flower in June of the ſecond year; and when the ſtems are grown to their height, they ſhould be ſupported with ſtakes, to prevent their breaking, or falling to the ground. Their ſeeds ripen about the beginning of Auguſt.

*Skirrets*, which are a kind of parſnep, thrive beſt in a light and moiſt ſoil. They are propagated either by ſeeds, or by ſlips from the root, which is compoſed of ſeveral fleſhy fibres, about the thickneſs of a man's little finger, terminating in one head. This root, for which only the ſkirret is cultivated, is reckoned wholſome and nouriſhing: but it is flatulent, and too ſweet taſted for many palates. The ſeeds of this plant, which generally produce larger roots than the ſlips, ſhould be ſown about the end of March or the beginning of April, and if they are good, the plants will appear in five or ſix weeks. When they have put out their leaves ſo as to be well diſtinguiſhed from weeds, the ground ſhould be carefully hoed; and this ſhould be repeated three ſeveral times, in the ſame manner as is practiſed for carrots. In theſe hoeings, which ſhould be performed in as dry weather as poſſible, the better to deſtroy the weeds, the ſkirrets, whether ſown in broad caſt, or in drills, ſhould be thinned to the diſtance of at leaſt three inches from each other. In autumn, when the leaves begin to decay, the roots will be fit for uſe. Theſe may be preſerved all the winter, and till they begin to ſhoot in the ſpring, when they will become hard and ſticky. So will alſo thoſe which run up to ſeed the firſt ſummer, and which ſhould therefore be pulled up and thrown away.

The ſeaſon for propagating ſkirrets by offsets is in the ſpring, before they begin to ſhoot. The old roots ſhould be dug up then, and the ſide roots ſhould be ſlipped off with an eye or bud to each. Theſe ſhould be planted four inches aſunder, as big as large peas, and theſe, which are it's ſeeds, are the part uſed in the kitchen. It is propagated either from them, or by parting it's roots. Theſe heads ſhould be kept dry after they are gathered.

*Scorzonera*, commonly called viper's graſs, ſhould be ſown about half an inch deep, in light ground. The beſt time for this ſowing is the beginning of April; and the beſt method, in rows ſufficiently diſtant to leave room for digging the earth between them: for this will greatly increaſe the bulk of the roots, for which only ſcorzoneras are cultivated These roots are of the tap kind, about the thickneſs of a man's finger, brown without, white within, and full of a milky juice. They are accounted very wholſome, nouriſhing, and much more delicate than either parſneps or ſkirrets.

When the plants are come up, they ſhould be thinned to the diſtance of at leaſt ſix inches from each other in the rows, and kept clear from weeds, by hoeings repeated as often as may be neceſſary. Their roots may be taken up when the leaves begin to decay, for they have then done growing, and theſe may be preſerved all the winter in dry ſand: or they may be left in the ground till ſpring, and dug up as they are wanted: but thoſe which remain in the earth after February, will ſhoot up their flower-ſtems, and become ſtrong and ſticky.

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The ſeaſon for propagating ſkirrets by offſets is in the ſpring, before they begin to ſhoot. The old roots ſhould be dug up then, and the ſide roots ſhould be ſlipped off with an eye or bud to each. Theſe ſhould be planted four inches aſunder, in rows ſufficiently diſtant to leave room for digging between them.

*Turneps* have been ſo fully treated of in my third volume [i], and their culture in the field may be ſo eaſily applied to the kitchen garden, that I have nothing to add here, unleſs it be, that the French turnep, which muſt be uſed young, is ſo ſmall that it is boiled whole in ſoups, and is much eſteemed for that purpoſe in foreign countries; that the long-rooted turnep, which muſt alſo be uſed whilſt it is very young, will grow to as great a length as the parſnep, but is apt to be extremely rank; that the yellow turnep has yellow fleſh, as well as a yellow rind; that the young tops of this plant are ſometimes eaten by country people, inſtead of ſprouts; and that if the turneps which are intended for ſeed are tranſplanted, they ſhould be removed in February, and ſet at leaſt two feet aſunder every way. The ground muſt be kept clear from weeds until the turneps have ſpread ſo as to keep them under. When the ſeed is near ripe, care muſt be taken to defend it from birds, which is beſt done by laying bird-limed twigs upon the ſeed branches of the turneps; for ſome of thoſe winged pilferers will be caught thereby, and if they are permitted to remain entangled there for ſome time, and afterwards turned looſe, they will for a while prevent others from coming to that place. When the ſeed is ripe, it ſhould be cut down, dried in the ſun, threſhed out, and laid by for uſe.

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[i] *Page* 149——173.

## *ARTICLE* II.

## *Plants cultivated in the Kitchen Garden for their young ſhoots, their leaves, or their heads.*

*ARTICHOKES* require a rich, deep, and moiſt ſoil, thoroughly dug ſeveral times over, and mixed with plenty of well rotted dung, to the depth of at leaſt three feet: for the deeper the mould is, the leſs watering they will require in the ſummer, and the larger and better flavoured their fruit will be in autumn. They may be raiſed from ſeeds: but the uſual and moſt expeditious way of propagating them is by ſlips, or ſuckers, taken from the old roots in February or March, or as ſoon as the hard froſts are over. Theſe ſuckers ſhould be taken off with ſome fibres to them; and if they are planted in a well prepared ſoil, like the above mentioned, they will yield fine fruit the next autumn.

The time for taking off theſe ſuckers, is alſo the proper ſeaſon for dreſſing the old ſtocks; which is performed thus. After all the earth has been removed from about the ſtock, down to below the part from which the young ſhoots are produced, two, or at moſt three, of the cleareſt, ſtraiteſt, and moſt promiſing of theſe ſhoots, iſſuing from the under part of the ſtock, are choſen for a crop. Theſe are far preferable to the ſtrong thick ſhoots that generally ſpring up from the crown of the roots with woody ſtems, which never produce good or regularly ſcaled fruit. The gardener then (having previouſly taken off the ſuckers intended for planting elſewhere, in doing of which care muſt be taken not to injure the plants intended to remain) forces off, with his thumb, all the other buds and young ſhoots, cloſe up to the head of the ſtock; ſeparates the young plants that are left as far aſunder as he can without breaking them; draws the earth up to them with a ſpade; preſſes it down cloſe around them with his hands; and then pulls off the tops of the leaves which hang down.

Some, when they give this dreſſing, dig their ground all over, and are well rewarded for their pains by the extraordinary fineneſs of their fruit.

When this is done, and the ground laid level, a crop of ſpinage may be ſowed between the ſtocks; for it will be gathered before the artichokes can cover the ground.

Toward the end of April, or beginning of May, when the plants begin to fruit, all the young ſhoots produced from their roots or ſtems ſince the dreſſing muſt be pulled up or cut off, ſo as to leave only the principal head, which will by that means bear a fine large fruit. When the artichokes are fit to gather, their ſtems muſt be cut down cloſe to the ground, in order that the ſtocks may make ſtrong freſh ſhoots before the end of October, which is the uſual ſeaſon for earthing them up, or, as the gardeners term it, landing them; though this may be deferred till any time in December, if the weather proves mild.

This earthing of them conſiſts in cutting off all the young ſhoots quite cloſe to the ground, then digging a trench between each row, and covering the ſtocks with the earth thrown up, in ſuch manner that they may be, as nearly as poſſible, under the middle of the ridge. This will ſecure them from any common froſt, and is infinitely better than the uſual practice of covering them with long dung, which never fails to render their fruit ſmall and very thin bottomed; for nothing is more prejudicial to this plant, than the burying of new dung near it's roots, or laying it about them; ſo great is the danger of it's making them rot, and of it's harbouring vermin which will deſtroy them. If, indeed, hard froſts are apprehended, a quantity of long dung, peas haulm, tanner's bark or any other light covering, may be laid over the ridges; becauſe it will there be at ſuch a diſtance as not to injure the roots. This covering ſhould not be laid on till there is no avoiding it; and it ſhould be carefully taken off as ſoon as the weather is mild; for the plants will certainly be injured if it lies too long upon them.

The plants thus earthed up will not require any farther care before the end of February, or beginning of March, by which time they will have grown through the ridge of mould; and this, if the weather be proper, is the ſeaſon for dreſſing their roots as before directed.

Though the ſtocks of artichokes will laſt ten, or even fifteen, years in a rich and deep ſoil; yet, as they are great impoveriſhers of the ground, their fruit will dwindle ſo as to render it moſt adviſeable to renew the whole plantation every fourth or fifth year, or, perhaps, rather every ſecond or third: to this end, the ground being prepared, and proviſion made of a ſufficient number of ſuckers choſen in the manner before directed, that is to ſay, clear, ſound, furniſhed with fibres, and not woody; the gardener ſhould pare off the knotted part which joined to the ſtalk. If it cuts criſp and tender, the ſucker is good; but if it be tough and ſtringy, the ſhoot is not worth planting. Having thus ſingled out thoſe that are fitteſt for his purpoſe, he ſhould cut off their large outſide leaves pretty low, in ſuch manner that the middle, or heart, leaves may riſe above them. After this, if the weather be very dry, or the plants have been long taken from the ſtocks, it will be right to ſet their root-ends, at leaſt, in a tub of water, for three or four hours, to refreſh them, before they are planted. The beſt method of planting them is in rows as ſtrait as poſſible, and at the diſtance of two feet from each other in the row. If there be more rows than one, as generally is the caſe where a full crop is wanted, theſe ſhould be five feet aſunder, and the plants ſhould be ſet quincunx faſhion. They ſhould be planted about four inches deep, the earth ſhould be cloſed very faſt to their roots, and, if the ſeaſon proves dry, they ſhould be watered twice or thrice a week, till they have taken good root. In a favourable ſeaſon, or on a moiſt ſoil, theſe plants will produce the largeſt and beſt artichokes in Auguſt and September, after all the old ſtocks have ceaſed to bear: ſo that a doubly long continuance of this fruit may be had, by making a new plantation every year.

A thin crop of ſpinage may be ſown upon this ground before the plants are ſet: but none of it muſt be ſuffered to grow very near them.

If any of the artichokes thus planted in the ſpring ſhould not produce fruit in the autumn, they may be made to yield it in the winter, or early the next ſpring, by tying up their leaves at the time of earthing up their roots, heaping up mould around till only their tops are ſeen, and then covering thoſe tops with a little ſtraw, or peas haulm, to defend them from froſt.

The kitchen gardeners near London, who endeavour to make the moſt of every inch of their high-rated land, generally plant their rows of artichokes nine or ten feet aſunder; and beſides ſowing between them radiſhes or ſpinage, they plant two rows of colliflowers, at the diſtance of two feet and an half from each other in the rows, and of four feet from row to row; ſo that full five feet are allowed for the artichokes. In May, when the crop of radiſhes or ſpinage is taken off, they ſow along the middle of the ſpace between the two rows of colliflowers, a row of cucumbers, for pickling, at the diſtance of every three feet; and between the colliflowers and the artichokes they plant, for winter uſe, a row of cabbages or ſavoys, which have room enough to grow after the colliflowers and artichokes are taken off. Thus the ground is fully cropped during the whole ſeaſon.

If the artichoke ſtocks ſhoot but weakly in the ſpring, as they will do if they have been hurt by froſt or too much wet; the beſt way is to uncover them with a ſpade, to looſen and break the mould around them, or rather to dig the whole ground, if it be not planted with any thing elſe, and then to earth up a little the plants of each ſtock. In three weeks or a month's time after this, the ſlips will be fit to take off.

A moiſt rich ſoil always yields the largeſt and beſt artichokes: but if it be very moiſt, the roots will not live through the winter. Such ground ſhould therefore be allotted for freſh plantations made every ſpring, to ſupply the table in autumn, after the old ſtocks have done bearing: and for early fruit, the plants ſhould be in a drier ſituation. It ſhould alſo be open, and at a diſtance from the dripping of trees: for theſe would draw the plants up in height, and thereby render their fruit poor and ſmall.

The two ſorts of artichoke commonly cultivated in this country are the *globe* and the *French*. The former, which has by far the moſt fleſhy leaves, the thickeſt bottom, and the beſt taſte, is deſervedly preferred. It is alſo the largeſt. The ſcales of this ſort are brown, and turn inward. The French artichoke is more conical, it's ſcales are narrower, of a greener colour, and frequently turned outward, and it has a diſagreeable perfumed flavour.

In Italy and France they cultivate a ſmall red artichoke, which is eaten raw with pepper, ſalt, oil, and vinegar[k].

There are people who blanch the ſtalks of artichokes in autumn, and eat their pith, either raw or boiled. Chards of artichokes, otherwiſe called cuſtons, are the leaves of artichokes tied up, wrapped round with ſtraw in autumn and winter, and covered all over, except at top. This makes them turn white, and takes off a little of their bitterneſs. When boiled, they are ſerved up as Spaniſh cardoons: but they are wretched eating. Beſides, the plants on which theſe tricks are played, often rot and periſh during the time of whitening this traſh[l].

The bottoms of artichokes are good for many culinary uſes. The way to preſerve them all the winter is, to ſeparate them from the leaves, parboil them, and hang them up in a dry place, ſtrung on packthread, with a clean piece of paper between every bottom, to prevent their touching one another. Notable country houſewifes recommend them likewiſe pickled.

Beſides hard weather, and exceſs of wet, artichokes have alſo an enemy in field mice, which are fond of their roots, if they can come at them.

M. de Chateauvieux has raiſed moſt excellent artichokes in the open field, without dunging the ground at all, or even watering the plants; but ſolely by a judicious execution of the principles of the new huſbandry: ſo great are the benefits which accrue from a thorough ſtirring of the earth! Artichokes which he planted at the end of May, produced in September their firſt fruits, which were, in general, from twelve to fifteen inches in circumference.

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[k] *Maiſon Ruſtique, Tom.* II. p. 98.

[l] MORTIMER's *Art of Huſbandry, Vol.* II. *p.* 139.

ference*. Their leaves covered entirely beds ſix feet wide, in which they were planted[m].

This renders it highly probable, that if artichokes were always planted in ſingle rows, and in beds, by which means the ground between them may be the more eaſily and more frequently ſtirred, they would thrive better than in the common way of ſetting them in quincunx, or any other form, in ground laid out in one continued flat. The gardeners about great cities will not be eaſily brought into this method, nor indeed can they well afford it, becauſe they would hereby loſe ſome of their crops. But as this part of my work is deſigned chiefly for perſons who are not profeſſed gardeners, and whoſe garden is intended only for their own private uſe; I think it incumbent on me to point out the beſt way of raiſing each plant in it's greateſt perfection, without reſtricting myſelf to the conſideration of it's increaſe only. Yet even here, though laſting plants will not be proper among the artichokes, many others which ſtand but a ſhort time, ſuch as young ſalleting, ſpinage, &c. may be cultivated with propriety.

*Aſparagus* is propagated by ſeeds, and cultivated in the following manner.

Let a ſufficient number of the faireſt, largeſt, cloſeſt, and roundeſt buds be choſen in a good aſparagus bed, and then marked out by a ſtake thruſt down cloſe to each of them; but in ſuch manner as not to injure the crown of the root. Theſe ſtakes will ſerve, both to diſtinguiſh them from other plants, when numbers are run up, and to faſten them to when their height and lateral branches might otherwiſe endanger their being broken down by wind. Their berries will be ripe about the end of September, when their ſtalks ſhould be cut down, and the berries ſtripped off into a tub, where they ſhould remain three weeks, or a month, to ſweat. Their outer huſk will by that time be rotted. The tub ſhould then be filled with water, and a man ſhould break all the huſks, by ſqueezing them between his hands. The huſks thus broken will ſwim upon the ſurface, and the ſeeds will ſink to the bottom of the water, which, being poured off gently, will carry off the former along with it. The remaining ſeeds will be entirely cleanſed by ſtirring them about in two or three freſh waters, and pouring off the water as ſoon as they are ſettled. They ſhould then be ſpread upon a mat or cloth, and expoſed to the ſun and air in dry weather, till all their moiſture is exhaled: after which they ſhould be kept in a dry place till the beginning of February, when it will be time to ſow them.

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* If theſe were of the green, or conic ſort, which we call French artichokes, as it is highly probable they were, this ſize is the more ſurprizing, as that ſpecies never ſpreads near ſo much as our globe artichoke.

[m] Duhamel, *Culture des Terres, Tom.* IV. *p.* 455.

The manner of ſowing them is, to ſtrew them on a well dug and very level bed of rich earth, which muſt afterwards be trodden all over, to bury them, and then raked ſmooth. Too thick ſowing would be productive of only ſmall plants.

The only care requiſite during the next ſummer, is to keep theſe plants clear from weeds; and towards the latter end of October, when their haulm is quite withered, the thickneſs of about an inch of rotten dung may be ſpread over the ſurface of the ground, as well to enrich it, as to ſhelter the young buds from the winter's froſts.

The following ſpring will be the fitteſt time for tranſplanting theſe aſparagus; for it has been remarked by experienced gardeners, that they take beſt, and produce the fineſt roots, when they are but one year old. The ground into which they are to be tranſplanted ſhould be prepared a little while, but not long, before hand, by trenching it well, and burying at the bottom of each trench a good quantity of rotten dung, which muſt be covered with at leaſt ſix inches depth of fine mould. If the ſoil is dry, and the ſeaſon forward, this tranſplanting may be performed about the end of March; but for very moiſt ground, it is better to ſtay till the middle of April, about which time the plants generally begin to ſhoot. Thoſe who adviſe Michaelmas for this work, are wrong: for not one in five of theſe plants removed then will ever proſper.

The roots which are to be tranſplanted muſt be carefully taken up with a narrow pronged dung-fork, and not dug up with a ſpade, for fear of cutting them; the earth about them muſt be ſhaken off; they muſt be ſeparated from each other; and if they are laid even, with their heads uppermoſt, as they are to be planted, this precaution will be a means of ſaving ſome time and trouble. After this, the plot of ground being levelled, a line muſt be ſtretched very tight along one ſide of it, to direct the opening of a trench exactly ſtrait, and about ſix inches deep; which will conſequently reach very near to the ſurface of the dung underneath: but care muſt be taken not actually to turn up any of that dung. The tranſplanted roots are to be placed upright againſt the bank of this trench, with their fibres well extended (which the gardener will help with his fingers), and their buds ſtanding forward, ſo as to be about two inches below the ſurface of the ground, with which the trench is then to be filled up, raking it ſmooth. The diſtance from plant to plant, in the trench, ſhould be twelve inches; and when four parallel rows, a foot aſunder, have been planted in this manner, they will form a ſufficiently wide

bed,

bed, between which and the next a ſpace of two feet and an half ſhould be left, for an alley to go between them to cut the aſparagus, and do other neceſſary works.

A ſmall crop of onions may be ſown upon this ground immediately after it's having been thus planted: for the treading in of their ſeeds, and raking them over, will not hurt the aſparagus.

When the aſparagus and onions are come up, which will be in about a month or ſix weeks after the time of planting, they muſt be well weeded with a ſmall hoe, and theſe laſt muſt be carefully thinned, eſpecially around the young ſhoots of aſparagus. About three repetitions of this work, if it be well done, and in dry weather, will keep the ground clear from weeds till the onions are fit to be pulled up, which generally is in Auguſt; and one thorough clearing after they are gone will ſuffice till October, when the haulm of the aſparagus will begin to wither, and the beds are to be earthed up. Care muſt be taken not to cut off this haulm whilſt it is at all green, leſt the roots ſhould ſhoot out again, which would weaken them greatly: and when it is cut (which ſhould always be done with a ſharp knife), it's ſtems ſhould be left two or three inches above ground, as marks whereby to diſtinguiſh the beds from the alleys. The beds ſhould then receive another hoeing, and all the weeds and rubbiſh raked off from them ſhould be buried in the bottom of the alleys, which are now to be dug up, and the earth taken out of them thrown upon the beds, ſo as to raiſe theſe about five inches above the alleys. A row of coleworts (but not beans, as is the injudicious practice of many who do not conſider that the roots of theſe ſpread ſo wide as greatly to damage the two outſide rows of aſparagus) may then be planted in the middle of the alleys: but nothing ſhould, from this time, be ſown or planted upon the beds, which are to remain untouched till the enſuing ſpring. They muſt be hoed over, raked ſmooth, and kept clear from weeds during the following ſummer; and, in October, the alleys are to be dug up again, and the beds earthed as before.

In the ſecond ſpring after planting, the beds muſt be forked up with a flat pronged fork, commonly called an aſparagus fork, which is made on purpoſe for this uſe. This ſhould be done about the end of March, before the buds begin to ſhoot, and with great care not to bruiſe the head of the root by forking too deep; and, a little while after this, the beds muſt be raked ſmooth, juſt before the buds appear above ground: for by thus deferring to rake, and letting the ground lie ſomewhat rough, for a ſhort time, the mould will be more mellowed, all young weeds will be more effectually deſtroyed, and the beds will remain clean much longer than if the raking were totally omitted, or performed immediately after the forking.

Some aſparagus may be cut in this ſecond ſpring after planting: but it will be much better to wait till the third. However, if curioſity does prevail, let a few, and only a few, of the largeſt buds be taken after they are about four or five inches high, and let all the reſt run up to ſtrengthen the roots: for though the quantity of ſhoots will be increaſed by the cutting of a greater number of heads, they will at the ſame time be ſo much the ſmaller, and the roots will decay the ſooner.

The right way to cut aſparagus is, to open the ground around the head intended to be gathered, with a very narrow and long bladed knife, filled with teeth like a ſaw, in order to ſee whether any other young buds are coming up cloſe by it. If there are, it will then be eaſy to avoid hurting them: but without this precaution, that miſchief cannot well be ſhunned; as the heads of aſparagus ſhould, generally, be cut, or rather ſawed off, about three inches underground. People who are uſed to this buſineſs will do a great deal of it in a ſhort time, though it may ſeem tedious and troubleſome to others; but the caution here given is abſolutely neceſſary to be obſerved by all who cut aſparagus.

The dreſſing of the aſparagus beds is every year the ſame as here directed for the ſecond, namely, clearing them from weeds by repeated hoeings at the proper ſeaſons, digging the alleys and earthing up the beds in October, and forking the beds toward the end of March; with the addition of this farther circumſtance, that it will be proper every other year to lay ſome well rotted dung (taken from a melon or cucumber bed) all over the beds of aſparagus, and likewiſe to bury ſome of it in the alleys, when they are dug up. This will keep the ground in ſuch heart, and the roots in ſuch vigour, that a plot of good aſparagus will yield fine heads during ten or twelve ſucceſſive years, if it be not cut too long each ſeaſon: for unleſs theſe plants are ſuffered to run up pretty early in June, their roots will be greatly weakened, and their ſhoots will be ſo much the ſmaller. For this reaſon, where aſparagus is required late in the ſeaſon, it is much better to ſet a few beds for that purpoſe, than to injure a whole plantation by cutting it too long.

The way to raiſe aſparagus from their ſeeds is, after the ground has been well trenched, dunged, and levelled, to prick holes in it, not above half an inch deep, and about a foot aſunder, and to drop into each of theſe two ſeeds, leſt one ſhould miſcarry. They are, of courſe, eaſily covered over as ſoon as ſown. Theſe holes ſhould be in ſtrait ows, directed by a line ſtretched acroſs the ground; their diſtance from each other ſhould be one foot, and a ſpace for an alley between the beds ſhould be left after every fourth row, if theſe plants are intended to ſtand for cutting in the place where they have been ſown; which, ſays the the moſt celebrated gardener of this age[a], "is a "very good method", becauſe, "as the roots of "aſparagus always ſend forth many long fibres "which run deep into the ground; ſo, when the "ſeeds are ſown where they are to remain, theſe "roots will not be broken or injured, as thoſe "muſt be which are tranſplanted: therefore they "will ſhoot deeper into the ground, and make "much greater progreſs, and the fibres will puſh "out on every ſide."—But, with Mr. Miller's leave, the very argument which he alledges here in favour of the practice of thoſe who do not remove their aſparagus from the place of it's firſt growth, is, to me, who love to be guided by facts, rather than by mere ſpeculation, the ſtrongeſt reaſon that can be for tranſplanting it: numbers of abſolutely deciſive experiments, ſeveral of which have been related in the courſe of this work, having proved beyond all doubt, that fibrous rooted plants of every kind are, without exception, ſignally benefited, inſtead of being hurt, by taking off the extremities of their roots, which never fail, in lieu of them, to put forth an increaſe of new fibres, whereby the plant is ſupplied with food more plentifully than before. All M. Duhamel's experiments, all thoſe of his correſpondents, and all thoſe, in particular, of the very accurate and judicious M. de Chateauvieux, and, before them, thoſe of our own countryman, Mr. Tull, evince the truth of this indiſputable fact. Even tap-rooted plants are, in this reſpect, equally benefited by cutting off the end of that long root; becauſe the ſo doing makes them ſtrike out numbers of new horizontal roots and fibres, which convey a ſo much greater quantity of food to the plant. We have a ſtriking inſtance of this in the lucerne tranſplanted by M. de Chateauvieux [o]; and even Mr. Miller himſelf, when he ſpeaks as a flower gardener, (in which his long and extenſive practice has afforded him uncommon room to excel,) very frequently adviſes cutting off the extremities of the roots of flowers, in order to make their heads thrive the better, by an increaſe of fibres which thoſe very roots will then put forth. The only reaſon for not cutting off the tip of the tap-root of ſuch plants as carrots, parſneps, &c. which are cultivated for that root alone, is, not that it would ſtint the growth of their heads, for the contrary is known to be the caſe; but becauſe it would ſtop the perpendicular growth of their roots, and make them ſtrike out ſide-ways, in numbers of new roots and fibres, which would convey additional food and ſtrength to their ſhoots above ground, where, for them, it is not wanted. But, as the deſign in cultivating aſparagus is to make them produce as many large heads, or buds, as poſſible; I cannot conceive how this author could thus forget himſelf, or why aſparagus alone ſhould here be an exception to the general, and well known, laws of nature.— I was going to ſay, that 'tis pity this gentleman did not attend more carefully than he ſeems to have done, to the vaſt improvements lately made in agriculture, before he promiſed, in the title page of his dictionary, (the merit of which I am far from meaning to depreciate in any ſhape, in what relates immediately to his knowledge as a botaniſt,) to give the beſt and neweſt methods of performing the practical parts of huſbandry. Had he but read attentively, and conſidered well, the unvaried tendency and reſult of the many intereſting experiments clearly recorded in M. Duhamel's Treatiſe on the Culture of Land, he would moſt certainly have altered and improved ſeveral articles in the late edition of the abridgment of his dictionary, and thereby have rendered it an excellent work; a work, for which the public would then have been doubly obliged to him.

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[a] MILLER's *Gardner's Dict.* Art. ASPARAGUS.

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[o] See *Vol.* III. *p.* 260 and 263.

He may, indeed, be partly very right in the reaſon which he aſſigns for letting the aſparagus raiſed from ſeeds remain where they were firſt ſown, if it be right to have four rows of them in one bed; becauſe, as the two middle ones cannot then receive any benefit from the culture beſtowed on the alleys, they will ſtand in need of every advantage that can be derived from the greateſt depth of good ground to which their roots can penetrate. But, for the ſame reaſon that it muſt be of ſervice to aſparagus, as it is ſignally to all other of the many rooted plants, to have an increaſed number of mouths whereby to imbibe their food; it ſeems more than probable, that theſe alſo would thrive beſt, and conſequently produce the largeſt heads, if only two rows of them were planted a foot aſunder in a bed two feet wide, with an alley of nearly the ſame breadth on each ſide. This will be a ſufficient ſpace for ſtirring, or digging, the earth between the beds, and each of the rows of aſparagus would conſequently receive therefrom the ſame remarkable benefits as we ſee accrue to all other plants that are cultivated in this manner. The ſize of the heads thus raiſed would perhaps fully compenſate for the extraordinary quantity of ground here required.

We have ſeen how amazingly the plants of wheat cultivated in the new way are benefited by the firſt ſtirring of the alleys in the ſpring, at which time it is a rule to bring the horſe-hoe as near to the plants as can be without actually tearing them up. May we not, from a parity of reaſon, naturally conclude, that ſtirring the ground as near to the rows of aſparagus as experience ſhall ſhew may be done with ſafety, will be attended with an equal advantage?

That aſparagus are very greatly benefited by that frequent deep ſtirring of the earth in which the excellence of the new huſbandry conſiſts, has been demonſtrated by M. de Chateauvieux, who, on the 24th of March 1753, planted in a bed two hundred feet long, and ſix feet wide (prepared only by repeated thorough plowing, without the leaſt help of dung, or any other manure,) a row of aſparagus, which made good ſhoots that very year[p]. In the next, which was but their ſecond, they were as fine as any in the beſt cultivated gardens[q]: and in the third and fourth, they were larger, better taſted, and in every reſpect finer, than thoſe of his kitchen garden[r].

The important circumſtance which M. de Chateauvieux mentions expreſly here, and which he and all good huſbandmen who have given the new huſbandry a fair trial, particularly for the culture of pulſe and pot herbs, have conſtantly experienced, *viz.*; that they are *better taſted* than any that are raiſed in the common way, makes me quite at a loſs to underſtand Mr. Miller, when he ſays[s]:

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[p] DUHAMEL, *Culture des Terres, Tom.* III *p.* 168.

[q] *Id. ibid. Tom.* IV. *p.* 455.

[r] *Id. ibid. Tom.* V. *p.* 544.

[s] *Gardener's Dict.* Art, ASPARAGUS.

"I cannot help taking notice of a common "error which has long prevailed with moſt people, "which is, that of not dunging the ground for "aſparagus, believing that the dung communi"cates a ſtrong taſte to the aſparagus; which is a "great miſtake, for the ſweeteſt aſparagus is that "which grows upon the richeſt ground, and poor "ground occaſions that rank taſte, ſo often com"plained of; the ſweetneſs of aſparagus being "occaſioned by the quickneſs of it's growth, which "is always proportionable to the goodneſs of the "ground, and the warmth of the ſeaſon: but in "order to prove this, I planted two beds of aſpa"ragus, upon ground which had dung laid a foot "thick; and theſe beds were every year dunged ex"tremely thick, and the aſparagus produced from "theſe beds was much ſweeter than any I could "procure, though they were boiled together in "the ſame water."

It is allowed, that the ſweeteſt aſparagus is that which grows upon the richeſt ground: and it is very probable that the quickneſs of it's growth, which is perhaps always, or at leaſt generally, proportioned to the goodneſs of the ſoil and the warmth of the ſeaſon, does greatly contribute to that ſweetneſs: though it may, not irrationally, be much doubted, whether the bare quickneſs of it's growth is the ſole cauſe thereof, as Mr. Miller ſeems to aſſert, or whether that deſirable quality in aſparagus is not more immediately derived from the ſoil itſelf.—But, in the name of all good huſbandry, is there no ground rich, aye very rich, without it's being ſtuffed with dung? Is there no ſuch thing as a naturally rich, very rich ſoil? Are there no other manures than dung? Is there not a way to render ſoils very rich by a due mixture of earths only? And have not the late admirable improvements, upon Mr. Tull's plan, demonſtrated that, as

Mr. Evelyn long ago rightly aſſerted, even the moſt barren ſoil may be rendered very fertile by proper culture alone? Have we not an irrefragable proof of this in the piece of abſolute clay which the truly intelligent M. de Chateauvieux brought to ſuch a ſtate, merely by frequent digging, as to enable it to bear as large and as fine plants of wheat, as any that his garden could have produced[t]?

The kitchen gardeners about London, who live by ſelling the produce of their high-rented grounds, are indeed, in ſome meaſure, forced to uſe a great deal of dung, in order to have either very early, or very many crops, or both; and the motive which compels them to it, pleads their excuſe for ſo doing: but it ſurely ought not to be the practice of gentlemen, or of thoſe whoſe gardens are cultivated only for the uſe of their own tables; for, whatever Mr. Miller may ſay, either all the garden ſtuff that is raiſed around this metropolis, by the trading kitchen gardeners, who bring it here to market, does taſte abominably ſtrong of dung, or half the people in and about this city have, as well as myſelf, entirely loſt the faculty of diſtinguiſhing one reliſh from another.

It may be true, though I do not know it to be ſo, that poor ground gives aſparagus a rank taſte: but certainly it does not give it *that* rank taſte which is ſo much and ſo juſtly complained of, as being the effect of dung: for poor ground, if any one ſhould be ſo very thoughtleſs as to plant aſparagus in it, will never produce ſuch large heads as we frequently ſee upon the tables in London, and which, notwithſtanding their ſeeming fineneſs to the eye, often are even nauſeouſly rank.

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[t] See *Vol.* I. *p.* 269.

As to the latter part of the above quotation from Mr. Miller, I confeſs myſelf ſo ignorant as not to be able to conceive that it proves any thing whatever. " To prove this" (*viz.* that it is not dung, but the poorneſs of the ground, which occaſions the rank taſte ſo often complained of in aſparagus), " I planted", ſays he, " two beds of " aſparagus upon" (we will ſuppoſe *in*) " ground " which had dung laid a foot thick; and theſe beds " were every year dunged extremely thick, and the " aſparagus produced from theſe beds was much " ſweeter than any I could procure, though they " were boiled together in the ſame water."—— Should we not have been told from what kind of ſoil the other aſparagus, by which this compariſon was to be made, were taken? It may have been from even yet more thickly dunged ground, for aught we know, or are informed, to the contrary. —But I will ſuppoſe them to have been produced by undunged ground.—Still, is not the boiling of both ſorts *together* in the ſame water, a ſtrange way of making the compariſon? M. de Chateauvieux, M. Duhamel, or any other perſon uſed to make accurate experiments, would ſurely have boiled each ſort in a ſeparate veſſel, during an equal ſpace of time, and over an equal degree of heat, as well as in the ſame ſort of water. For want of this neceſſary explanation concerning the different growths of the aſparagus, and for want of theſe other equally neceſſary precautions, I really do not ſee that this experiment of Mr. Miller is at all concluſive, or even that it conveys any clear and appoſite meaning. — M. de Chateauvieux's is deciſive: for his aſparagus, raiſed in the field, without any dung at all, " were always" (during the four years of his relating this experiment) " larger, *better taſted*, and in every other " reſpect finer, than thoſe of his kitchen garden."

—This is ſpeaking clearly, and to the point; as every one ſhould do, who has indiſputable facts to go by.

The forcing, as 'tis called, of aſparagus, in order to have it earlier than the natural ſeaſon, (and by the ſame means of hot-beds it may alſo be had later, and indeed all the year round,) is a great trade with the kitchen gardeners near London: but as it cannot be worth the private gentleman's, or the farmer's, while to be at that trouble and expence, I ſhall here paſs over that unneceſſary part of gardening.

*Beet (white)* is cultivated for it's leaves only, which are frequently uſed in the kitchen, for ſoups, &c. The green beet, and the Swiſs or chard beet, are only varieties of this ſpecies, which ſhould be ſown in the beginning of March, without any mixture of other crops, upon an open, and not over moiſt, ſpot of ground. Three hoeings, as before directed for red beets in the garden [u], are alſo requiſite here; and at the laſt thinning, the plants of the white, or the green, ſort ſhould not be left nearer than eight or ten inches aſunder, if regard be paid to the goodneſs of their leaves. The Swiſs kind, which has larger leaves, ſhould have a few inches more room allowed it. When the leaves are fit for uſe, as they will be pretty early in June, the outer ones ſhould be gathered firſt, in order to leave the others time to increaſe. By this means a ſmall ſpot of ground will yield a ſufficiency for a middling family, and furniſh a conſtant ſucceſſion of leaves during the whole year, if the plants are not ſuffered to run up to ſeed; for then their leaves ceaſe to be good.

The chards as they are called, of this ſort of beet, are the white, thick, and downy main ſhoot produced in the middle of their tops, by covering them during the winter with long dry dung, as ſome do their artichokes. When this is practiſed, the plants are uncovered in April, and the earth is then dreſſed carefully about them.

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[u] See *p.* 25.

The ſeeds of the white beet ripen ſomewhat earlier than thoſe of the red. The manner of obtaining, gathering, and keeping them, is the ſame for both.

*Borecole*, is of three ſorts, namely, the common borecole, the green borecole, and the Siberian borecole, which is the curled colewort, by ſome called Scotch kale. All theſe are for winter uſe; but the laſt is moſt eſteemed. The two former are ſown about the middle of April, and are fit for tranſplanting in about two months after. When this is done, the plants of either of theſe ſorts ſhould be ſet a foot aſunder in rows two feet diſtant from each other. They ſhould not be eaten before the froſt has rendered them tender; for till then they are tough and bitter. The Siberian borecole, which is extremely hardy, never injured by cold, and always ſweeter in ſevere winters, than in mild ones, need not be ſown till the beginning of July, and when it's plants are ſtrong enough for removing, that is to ſay, when they have about ſix or eight leaves, they ſhould likewiſe be ſet in rows. The diſtance of a foot and an half, or, perhaps, rather two feet again, between the rows, and of ten inches between the plants in the rows, may be ſufficient here. Theſe will be fit for uſe ſoon after Chriſtmas, and continue good till April. The ſoil for borecole ſhould be a good, freſh, deep looſened earth. The manner of ſowing, tranſplanting, and cultivating of it, is the ſame as for cabbage, like which the new ſet plants of borecole ſhould be watered every other evening till they have taken freſh root. The common way is then to draw the earth up around their ſtems with a hoe, to keep the ground moiſt about them, and thereby ſtrengthen the plants: but good digging, deep hoeing, and frequent ſtirring of the earth between them, according to the principles of the new huſbandry, will anſwer all theſe ends much better, and make the plants proſper greatly more.

*Brocoli* requires a good and pretty deep ſoil, rather light than otherwiſe. The proper time for ſowing it is from the latter end of April to the beginning of June; and the manner, the ſame as for cabbage. When the plants are about a fortnight or three weeks old, that is to ſay, when they have got ſeven or eight leaves, they ſhould, like all others of the cabbage kind, be tranſplanted into beds of well prepared mould, and toward the end of July they will be fit to replant where they are to remain. This ſhould be in a well ſheltered ſpot, but not under the drip of trees. The plants ſhould here be ſet in rows at leaſt two feet aſunder (but two feet and an half, or even three feet, will be yet better), and at the diſtance of a foot and an half, or rather two feet, from each other in the rows. Towards the end of December, if the weather is not very ſevere, they will begin to ſhew their ſmall heads, which, eſpecially at their firſt appearance, are not unlike to colliflowers. Theſe heads ſhould be cut off before they run up to ſeed, with about four or five inches of the ſtalks; and a great number of ſide ſhoots, produced from the ſtem, will ſucceed them, and continue fit for eating till the middle of March. They will not indeed be ſo large as the former, but they will be full as well taſted. The ſkin of the ſtaks ſhould be ſtripped off before they are boiled.

The Roman or purple brocoli, the Naples or white brocoli, and the brown or black brocoli, are the ſorts cultivated in the kitchen garden. The former of theſe is the beſt flavoured, and continues longeſt in ſeaſon; for which reaſons it is the moſt eſteemed. The white brocoli taſtes ſo like the colliflower, that it is not always eaſy to diſtinguiſh them. The brown or black ſort is the leaſt delicate; but it is the hardieſt, and grows to the largeſt ſize.

For a ſecond crop, to ſupply the table after the firſt is gone, Mr. Miller adviſes [x] the ſowing of brocoli again in the beginning of July: but Mr. Switzer thinks it wrong to ſow this plant even ſo late as Midſummer, "becauſe, ſays he [y], it's ſtems will not "be ſtrong enough before the winter to produce "that number of ſprouts which otherwiſe they "would." He therefore prefers portioning out the plants into three parts, and cutting their heads off entirely within a foot and an half or two feet, of the ground; beginning to do this to one parcel about a fortnight before Michaelmas, to the next about a month after, and to the laſt about a fortnight or or three weeks before Chriſtmas; by which means a continued ſucceſſion of ſprouts will iſſue from the ſides of their remaining ſtems.—Mr. Miller's method here will produce the largeſt heads, and Mr. Switzer's the greateſt number of ſmall ones.

The common practice of earthing up the ſtems of the brocoli plants from time to time, cannot be near ſo beneficial as frequent deep digging and ſtirring of the ground between them, according to the principles of the new huſbandry. We have already ſeen [z] remarkable inſtances of the advantage of this culture applied to cabbages, of which this is a ſpecies.

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[x] *Gardener's Dict.* Art. BRASSICA.

[y] *Method of raiſing Italian Brocoli, Spaniſh Cardoon, &c. p.* 2.

[z] *Vol.* III. *p.* 198.——200.

The ſeeds of brocoli are ſaved in the ſame manner as thoſe of the common cabbage; or if there be any difference, it is in regard to the white brocoli, of which it is beſt to reſerve a few of the largeſt heads of the firſt crop, and let them run up to ſeed, carefully ſtripping off all the under ſhoots, ſo as to leave only the main ſtem. If this is duly obſerved, and no other ſort of cabbage is ſuffered to run up near them, the ſeeds of the white broccoli will be obtained as perfect here, as any that are imported from abroad; nor will the plants produced by them degenerate in many years.

*Cabbages* of all ſorts delight in a deep, rich, light, and well-looſened mould, in an open ſituation. They will indeed grow in any ordinary ground that has been well dug; but the better the ſoil and it's tilth are, the finer and better flavoured theſe plants will be.

The early and the ſugar-loaf cabbages, commonly called Michaelmas cabbages, are the ſorts generally ſown for ſummer uſe. The moſt proper ſeaſon for ſowing them is about the end of July, or beginning of Auguſt. When the plants have ſeven or eight leaves, they ſhould be removed into beds of well-prepared mould, and there ſet about three or four inches aſunder every way, that they may grow ſtrong, without running up in height; and towards the end of October, they ſhould be tranſplanted again, into the place where they are to remain. They ſhould here be ſet in rows three feet aſunder, and two feet and a half diſtant from each other in the row. They muſt be kept clear from weeds, and ſhould either be earthed up from time to time, as is the common practice, or, which will be much more beneficial, the ground between them ſhould be repeatedly dug pretty deep, or otherwiſe well ſtirred and looſened, during their growth, as before directed for their culture in the field[a]. About May, they will turn in their leaves for cabbaging; and if this is helped then by tying them up pretty cloſe with a ſlender twig of oſier, their heads will be blanched in the middle, and fit for cutting, at leaſt a fortnight ſooner than they would be if not tied up. But it is to be obſerved of this early kind, that it completes it's cabbaging very ſoon after it has once begun to turn, and almoſt as quickly afterwards becomes hard and burſts. The ſugar-loaf ſort, which is not ſo cloſe leaved, grows and cabbages more ſlowly, and continues good for a longer time.

The muſk cabbage, which requires exactly the ſame culture as the former, will be fit for uſe in October, and will laſt till Chriſtmas: but it is much more apt to be killed by hard weather.

The common, white, red, flat, and long ſided cabbages are cultivated chiefly for winter uſe. The time for ſowing them is the beginning or middle of April. The young plants of theſe ſorts, like thoſe of all other cabbages, ſhould be pricked out into ſhady borders, when they have got ſix or eight leaves, that they may acquire ſtrength, and not run up with high ſtems; for the ſhorteſt ſhanked cabbages are always found to ſucceed beſt. Towards the middle of June, they ſhould be tranſplanted from theſe borders into the places where they are to remain, at the diſtance of two feet and an half from each other, in rows three feet and an half aſunder; for this will be ſufficient, either for earthing up their ſtems, as is the common way, or for the much more beneficial method of digging and ſtirring the earth between them. If they are planted out in a dry ſeaſon, they ſhould be watered every other evening till they have taken freſh root.

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[a] *Ibid.*

The kitchen gardeners near London generally plant rows of theſe cabbbages between their artichokes, colliflowers, &c. as was obſerved before; but they ſeem, upon the whole, to do beſt when planted alone. They will begin to be fit for uſe ſoon after Michaelmas, and will continue good till the end of February, if the winter be not ſo ſevere as to deſtroy them. This may be prevented by pulling them up in November, trenching the ground up in ridges, laying the cabbages as cloſe as poſſible, on one ſide, againſt thoſes ridges, and then burying their ſtems in earth thrown over them. They may be kept thus till after Chriſtmaſs; for though their outer leaves may decay, as they often will in very wet or hard weather, their inſide will remain ſound, if they were large and hard when thus laid down.

Savoys require exactly the ſame treatment as the foregoing, excepting that, as they do not grow ſo large, they need not be planted ſo far aſunder. Two feet and an half ſquare will be a ſufficient diſtance between them. They always thrive beſt in an open ſituation, quite free from trees and hedges; for they are very apt to be greatly preyed upon by caterpillars and other vermin, in cloſe places, eſpecially if the autumn prove dry. They are moſt eſteemed after they have been pinched by the froſt.

The management of the Ruſſian cabbage, which is ſo hardy as to bid defiance to the ſevereſt winter, differs not from the foregoing in any ſhape, unleſs it be, that, like the ſavoy, it ſhould not be ſown till late in the ſpring, and, being very ſmall, it does not require much ſpace when planted out. It ſhould likewiſe have a clear open ground to grow on; but it will not laſt long before it will burſt and run up to ſeed. Many think it a very ſweet and well taſted plant, though it is not now cultivated near ſo much as it uſed to be. The trading gardeners around this city ſeem to have excluded it entirely from their grounds; perhaps chiefly becauſe of it's ſmallneſs: but it merits ſtill to find a place in private kitchen gardens.

The turnep-rooted cabbage is much eſteemed in Germany; but it is here deemed too coarſe and ſtrong. However, a hard winter, for it will bear a great deal of cold, will in a great meaſure remove both theſe objections. It's culture is the ſame as that of other cabbages; but it ſhould not be ſown much before the end of the ſpring.

The Sea-cabbage, which grows naturally upon the gravelly ſhores in ſeveral parts of England, and particularly, in great plenty, in Suſſex and Dorſetſhire, where many people dig it up from among the gravel, in the ſpring, and prefer it to every other kind of cabbage; is, in that blanched ſtate, before it's ſhoots have been expoſed to the air, very ſweet and tender, and may be eaſily propagated in gardens, by ſowing it's ſeeds ſoon after they are ripe, in a ſandy or gravelly ſoil. It will thrive there exceedingly, and increaſe greatly by it's creeping roots: but it's heads will not be fit to cut before the ſecond year. To have it in perfection, a layer of ſand or gravel, four or five inches thick, ſhould be ſpread, at Michaelmas, upon the bed in which theſe plants grow, in order to allow a ſufficient depth for cutting their ſhoots before they appear above ground; for, till then, they will be white, tender, and well taſted: but the air, if they are permitted to grow up into it, ſoon renders them green, tough, and bitter. This earthing up, or rather new ſanding or gravelling of the bed, ſhould therefore be repeated every autumn, in the ſame manner as is practiſed for aſparagus. It is the only culture that this ſort of cabbage will require.

The beſt method of ſaving the ſeeds of all ſorts of cabbages has been directed in the preceding volume of this work, to which I therefore refer [b]; there being no ſort of difference, in this reſpect, between thoſe that are cultivated in the field, and thoſe which are raiſed in the kitchen garden: but it will be right, in either place, to obſerve Mr. Miller's caution [c], not to plant more than one ſort in the ſame ſpot, or near together, when they are intended for ſeed; for example, never to intermix red cabbages with white, or ſavoys with either of them, becauſe the commixture of their *farina fæcundans*, or male duſt, will almoſt certainly produce a mixture of kinds. It is wholly owing to this neglect, that the Engliſh gardeners ſeldom ſave any good ſeeds of the red cabbage, but import them annually from abroad, upon the falſe ſuppoſition that the ſoil or climate of this country makes them change from red to white, or to a colour between both: but if they were to plant red cabbages by themſelves, for ſeeds, and not ſuffer any other ſort to ſtand near them, there is no doubt but that the ſpecies might be continued here, as perfect as in any other place.

*Cardoon (the Spaniſh)*, ſo called becauſe it is much uſed in Spain, is a kind of wild artichoke, propagated only by it's ſeed, which is of an oval form, about as big as a grain of wheat, of a very dark green or blackiſh colour, and marked with black ſtreaks from one end to the other. There are two ſeaſons for ſowing it: the firſt is, from the middle to the end of April; and the other, about a month later. The ſoil ſhould be rich, deep and fine. In a bed of ſuch mould, four or five feet wide, two trenches are opened, a foot wide, ſix inches deep, and at leaſt three feet aſunder: or, to anſwer the ſame intention, two rows of holes, of that depth and diameter, are dug ſtrait by a line ſtretched along the bed. Theſe holes ſhould be three feet aſuuder, and in quincunx order; or, if a trench is uſed, the quincunx form ſhould be obſerved in the ſowing of the ſeeds, which is performed thus. Five or ſix of the ſeeds are dropped nearly together, at the diſtances before mentioned, and then covered over: not with a deſign to let ſo many plants grow cloſe together in a thick cluſter; but, as the growth of theſe ſeeds is ſomewhat precarious, to be the more certain of having two or three plants at each ſtated diſtance: for if all of them come up, they are immediately thinned to that number; and if they miſcarry entirely in any one ſpot, the chaſm is filled up with plants taken from another place, generally a hot-bed, on which ſome of theſe ſeeds are moſt commonly ſown when it's heat is expiring, for a recruit in caſe of need. The firſt ſowing will generally come up in three weeks, and the latter in about fifteen days. Great care muſt be taken to keep theſe plants clear from weeds, and to water them frequently, in order to make them increaſe in bulk, and not run to ſeed. But this intention of M. de la Quintinie and Mr. Switzer will certainly be much better anſwered in every reſpect, by a proper application of the principles of the new huſbandry; that is to ſay, by deep and frequent ſtirring of the earth on each ſide of the bed; even ſo as not to fear letting the ſpade approach to within a very few inches of the plants.

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[b] See *Vol.* III. *p.* 195.

[c] *Gardener's Dict.* Art. BRASSICA.

Towards the latter end of October, the cardoons thus cultivated will be fit for tying up, in order to their been blanched. To this end, a dry day ſhould be choſen, all the leaves of each cluſter ſhould be collected cloſe together, and wiſps of ſtraw, or long litter, ſhould then be twiſted around them, ſo as to prevent the acceſs of air to any part of them, except their very top, which ſhould be left open. In a fortnight or three weeks, the plants thus covered will become white, and fit to eat.

This tying up and blanching of cardoons may be continued till the winter approaches; and then, thoſe who are ſo fond of them as to think it worth their while to be at the trouble, may take them up with ſome earth about their roots and remove them into a green-houſe, if they have one, or into a cellar, and by that means keep them for uſe all the winter. Some of theſe may be replanted in the ſpring, in an open border as before, to ſeed in June or July; or they may be cut down to the ground when thus planted anew, and their ſecond year's ſhoots may be tied up and whitened as before.

Beſides the uſe which the French, Italians, and Spaniards, make of this cardoon, in eating it raw with pepper, ſalt, oil, and vinegar; many think it preferable to celery, when ſtewed, becauſe it is mellower and much more tender.

*Celeriac*, which is a ſpecies of celery, ſhould be ſown at two or three different times, in order to have, during the whole ſeaſon, a ſucceſſion of plants which do not run up to ſeed. The firſt ſowing may be in the beginning of March, in which caſe it ſhould be upon a gentle hot-bed, on account of the rawneſs of the weather at that time of the ſeaſon: the ſecond may be at the end of the ſame month, in an open ſpot of fine, rich, moiſt, and light earth, fully expoſed to the warmth of the ſun: and the third ſhould be by the latter end of April, or in the beginning of May, likewiſe on a rich and moiſt ſoil, diſtant from the drip of trees. If this ground is expoſed to the morning ſun only, it will be ſo much the better. Theſe ſeeds muſt be watered frequently, if the weather is dry; for otherwiſe they will not grow: but with this care they will put forth plants in about three weeks or a month, and theſe will be fit to tranſplant in five or ſix weeks after their coming up. When this is done, they ſhould be pricked out at the diſtance of about three inches ſquare from each other, in well prepared, and warmly ſituated, beds of moiſt rich earth: and if the ſeaſon prove cold, theſe beds muſt be covered with mats, to defend the young plants from morning froſts, which would greatly check their growth, or perhaps even kill many of them. In drawing them out of the ſeed-bed, care ſhould be taken to thin them where they grow too thick, and to leave the ſmalleſt to get more ſtrength before they are removed. By this means the ſame ſeed-bed will afford three different plantings, which will ſucceed each other for uſe.

By the middle of May, ſome of the firſt tranſplanted plants will be fit to remove again, for blanching: and herein only it is that the culture of celeriac begins to differ from that of celery. This laſt is tranſplanted into trenches, and there earthed up, as will be directed in the next article: but celeriac, which ſeldom grows above eight or ten inches high, and therefore requires but little earthing up, ſhould be planted in level ground, or in very ſhallow drills; it's great excellency being the ſize of it's root, which often grows as large as an ordinary turnep, even in the common way of ſetting theſe plants only ſix or eight inches aſunder in rows ſixteen inches apart, and earthing them up but once.——The judicious reader will here immediately apply to this plant, the far ſuperior method of culture uſed in the new huſbandry; and will, in conſequence thereof, ſee at once the expediency of ſetting theſe roots at ſuch diſtances as to allow proper room for ſtirring of the earth between them, to a ſufficient depth. There can be no doubt of it's improving their taſte, or of it's greatly augmenting their ſize: for the richer, finer, and looſer the mould is in which they grow, provided it be moiſt, the larger, ſweeter, and tenderer they will be. Frequent digging, or deep hoeing, about theſe plants, will alſo be attended with the farther advantage, firſt, of keeping them clear from weeds, which is abſolutely neceſſary; and ſecondly, of preventing their piping, or running up to ſeed, ſo ſoon as they generally do when managed in the common way.

*Celery* requires exactly the ſame treatment as celeriac (which ſee above) till it is tranſplanted for the ſecond time, in order to it's being blanched. The uſual way of performing this, is to dig a trench, by a line, about ten inches wide, and eight or nine inches deep, in a moiſt, rich, and light ſoil; to looſen and lay level the earth at the bottom of this trench, and to throw up on each ſide a ridge of the mould taken out, that it may be in readineſs there for afterwards earthing the celery. Theſe trenches are generally three feet aſunder; which is a ſufficient ſpace for digging between them after they are filled up. When the young plants have been trimmed, and the tops of their longeſt leaves cut off, they are ſet in one ſtrait row in the middle of the bottom of the trench, at about four or five inches diſtance from each other; their roots are then covered with mould trodden down cloſe to them; and care is taken to water them plentifully, till they have ſtruck out new roots. As theſe plants advance in height, freſh earth is drawn in cloſe to them on each ſide, but with great caution not to bury their hearts, or ever to do this in wet weather, leſt it ſhould make them rot. When they are grown conſiderably above the trenches, and all the ridges have been employed in earthing them up, a ſpade is uſed to dig up more earth from between the rows, and this is continued till they are fit for uſe. —But, whenever this is done, good deep digging, as near as can be to their roots, ſo as to lay freſh earth to them, would certainly be attended with all the advantages of which we have ſeen numerous ſimilar inſtances in the practice of the new huſbandry with a horſe-hoe, and they may at the ſame time be earthed up equally well.

The celery firſt planted out will be fit for uſe about the end of July. This will be ſucceeded by the after plantations; and the latter ſowings, if rightly managed, will yield a conſtant ſupply of it till April. The laſt crop ſhould be planted in a drier ſoil than any of the preceding; and to prevent it's being rotted by much wet in winter, it will be right to cover the ridges, eſpecially if there is any danger of hard froſt, with peas-haulm, or ſome other light covering, which will not ſmother the plants: for covering them too cloſe would alſo make them rot. However this will ſuffice to keep the froſt out of the ground, ſo that the celery may be taken up whenever it is wanted; which it cannot be if the earth around it is hard frozen. But this covering muſt be taken off as early in the ſpring as the weather will permit, leſt it ſhould make the plants grow pipy, and run to ſeed.

Celery will not continue good above three weeks or a month after it is fully blanched, but will then grow hollow, or rot. A ſucceſſion of at leaſt ſix or ſeven different plantings is therefore neceſſary for thoſe who would have a conſtant regular ſupply. For a ſingle family, even though a large one, much need not be planted at each time.

The beſt way to ſave the ſeeds of celery, or of celeriac, is to ſingle out ſome of the largeſt and fineſt roots, which have not been too much blanched, and to plant them, for the celery twelve, for the celeriac eighteen, inches aſunder, in a moiſt ſoil, early in the ſpring; and when they run up to ſeed, to ſupport them with ſtakes, to prevent their being broken down by the wind or other accidents. In July, when the ſeeds begin to be formed, it will be right to water the plants if the ſeaſon proves very dry; for this will greatly help them to produce good ſeeds: — or perhaps the ſame end may be anſwered full as effectually, if not more ſo, by keeping the earth around theſe plants well and deeply ſtirred, and therefore looſe and moiſt, by digging it in the manner which the practiſers of the new huſbandry have found to be ſo very beneficial, on this as well as all other occaſions. Theſe ſeeds will be ripe in Auguſt, at which time they ſhould be cut down, in dry weather, ſpread upon cloths in the ſun to dry, then beaten out, put into a bag, and laid up in a dry place.

*Colewort* (the common), or Dorſetſhire kale, has been of late beaten out of the kitchen grounds near London, by the trading gardeners, who find their account better in ſetting, in lieu of it, cabbage plants, or ſprouts. It's culture is exactly the ſame as that of the common cabbage; and it has the valuable qualities of being extremely well taſted, and ſo hardy that no froſt will kill it. I have already ſpoken of the curled colewort, or Siberian borecole[d].

*Colliflowers* ſhould be raiſed from the very beſt ſeeds that can poſſibly be procured; for on this their goodneſs will greatly depend. Mr. Miller is ſo minutely particular in his directions for cultivating

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[d] See *p.* 63.

ing theſe plants, which he ſeems to have attended to more carefully than any other writer upon gardening, that I cannot do juſtice to my readers better than by methodizing the ſubſtance of what he has ſaid on this ſubject[e]. He is almoſt ſcrupulouſly exact in fixing particular days for the ſowing of this ſeed, for the very good reaſon that a difference of only two or three days has often been known to make a great difference in the plants, and that the numerous claſs of gardeners about London have experienced their crops to ſucceed beſt when ſown at the times which he adviſes; though he allows that one day, more or leſs, will not make any great odds. His rules are calculated for the latitude, climate, and ſituation of the gardens around London; but they may, eſpecially with the help of a little experience, be eaſily ſuited to any other place.

In order to have very early colliflowers, the ſeeds of an early ſort ſhould be ſown on, or about, the twenty firſt day of Auguſt, upon an old cucumber or melon bed, which has entirely loſt it's heat. They ſhould be diſtributed rather thinly than otherwiſe, and covered with about a quarter of an inch thick of fine earth ſifted over them. If the weather proves very hot and dry, this bed ſhould be ſhaded with mats, to prevent the too quick drying of the earth, and, if there be occaſion, it may be watered a little from time to time. In about a month after ſowing, the plants will be fit to prick out. This ſhould be on other ſimilar old cucumber or melon beds covered with freſh mould; or, if theſe cannot be had, on beds made on purpoſe with a little new dung, and covered with mould like the former. This dung ſhould not be at all hot; for that would hurt the plants greatly at this ſeaſon, which generally is ſufficiently warm; and it ſhould be trodden down very cloſe, to prevent the worms from getting through it. The young plants ſhould be ſet in this bed about two inches ſquare aſunder, and they ſhould be ſhaded and watered there till they have rooted anew: but great care ſhould be taken not to water them too much after they have begun to grow, and likewiſe not to ſuffer them to receive too much rain, if the ſeaſon ſhould be wet, leſt they ſhould become black ſhanked, as the gardeners term it, meaning, rotten in the ſtem: for whenever this happens, the plant ſo affected is inevitably loſt. They muſt be kept very clear from weeds in this bed, and about the thirtieth of October they ſhould be tranſplanted from thence into the place where they are to remain during the winter.

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[e] *Gardener's Dict.* Art. BRASSICA.

This ſpot ſhould be well defended from the north, eaſt, and weſt winds, by walls, pales, or reed hedges, which laſt are by far the beſt, becauſe the winds do not reverberate from them, as they do from the former. The ground here, beſides being naturally rich, ſhould be well and deeply trenched, and a good quantity of thoroughly rotten dung ſhould be buried in it. If the ſoil is naturally wet, it ſhould be raiſed up in beds about two feet and an half or three feet wide, and four inches above the level of the ſpaces between them: but if it is moderately dry, the whole ſurface may be left flat. If it is very dry, the plants ſhould be watered a little, as ſoon as they are ſet; but by no means ſo as to make a puddle around them, as ſome very improperly direct.

Along the middle of each of theſe beds, or of each breadth of ground that would be allotted for a bed, a row of the young plants of colliflowers, now tranſplanted for the ſecond time, ſhould be ſet at ſuch diſtances from each other that there may be a clear ſpace of about two feet and an half between the bell or hand glaſſes with which they are to be covered during the winter: but two good plants ſhould always be ſet, at this time of planting them, under each glaſs, about four inches aſunder. If theſe colliflowers are intended for a full crop, the rows ſhould not be nearer together than three feet and an half: and if ridges for cucumbers are to be made between them, as is the general practice of the gardeners near London, they ſhould be full eight feet aſunder.

When the plants are thus ſet, the glaſſes ſhould be put over them, and kept cloſe down till they have taken root, which will be in about a week or ten days: but if a kindly ſhower of rain ſhould fall in the mean while, it will be right to uncover the plants, that they may receive the benefit of it. In about ten days after this planting, the glaſſes ſhould be raiſed three or four inches on their ſouth ſide, and ſupported there with forked ſticks, or bricks, ſo that the plants may have a free acceſs of air; and thus the glaſſes ſhould remain over them, night and day, except in froſty weather, when they ſhould be let down again as cloſe as poſſible: or if it ſhould prove very warm, as often happens in November, and ſometimes even in December, the glaſſes may be taken entirely off in the day time, and put on again only in the night; leſt the plants, by being kept too cloſe, ſhould be drewn into flower at that ſeaſon, as is frequently the caſe in mild winters, eſpecially if they are not ſkilfully managed.

Towards the end of February, if the weather is mild, another good ſpot of properly fenced ground ſhould be well trenched and dunged as before, and the leaſt flouriſhing of the two plants under each glaſs (for the ſtrongeſt is not to be removed

moved any more) ſhould be carefully taken up with a trowel, ſo as to preſerve as much earth as poſſible about it's roots, and at the ſame time not to damage the other. The plants thus taken up are to be ſet in this newly prepared ground, at the ſame diſtance as before; that is to ſay, if for a crop of colliflowers only, the rows ſhould be three feet and an half aſunder; but if for ridges of cucumbers between them, eight feet, and the ſpace from plant to plant, in the rows, ſhould be twenty eight or thirty inches.

The plants left under the glaſſes ſhould be earthed up, by drawing the mould towards their ſtems, with a ſmall hoe, as ſoon as theſe others have been removed from beſide them: but in the doing of this, great care muſt be taken not to let any of the earth fall into their hearts, leſt it ſhould rot them, or at leaſt conſiderably injure their future growth. After this earthing, the glaſſes ſhould be ſet over them again, but an inch or two higher than before, to give them more air, and with the precaution of taking them quite off whenever gentle ſhowers deſcend: for theſe will always greatly refreſh the plants.

When they begin to grow apace, and to fill the glaſſes with their leaves, which they will ſoon do after this little ſtirring of the ground, the earth around them ſhould be dug as deep and as near to the plants as can be without hurting them: for this will ſpeedily bring them very forward. In this digging, a kind of border may be raiſed around them, broad enough for the glaſſes to ſtand on, and about four inches high, which, with the farther help of a continuation of props to ſupport them, ſo as to let in the air, will give the plants ſuch increaſe of room, that the glaſſes may be continued over them till April: an advantage which they could not otherwiſe enjoy, without prejudice to their leaves; and of ſo much the greater conſequence, as there frequently are, in this country, ſuch ſevere returns of froſt about the latter end of March, as would greatly hurt theſe plants, if expoſed thereto, eſpecially after having been tenderly nurſed under glaſſes.

When the plants removed into the new ſpot of ground have been ſet, which it is beſt to do at the diſtances before mentioned, glaſſes ſhould be placed over them, pretty cloſe, till they have taken freſh root: the props of theſe glaſſes ſhould then be raiſed pretty high, eſpecially if the ſeaſon be mild, in order that there may be free acceſs of air to the plants, to ſtrengthen them; and in mild ſoft weather, as well as in gentle ſhowers of rain, the glaſſes of theſe, and of the other plants, which were left ſtanding, may be taken off entirely; for it will now be time to begin to harden them all by degrees, in order to enable them to bear the quite open air: but even while this is practiſed in the day, the glaſſes ſhould be continued over them as long as poſſible at night, if there be the leaſt danger of froſt. A farther eſſential caution, relative to the day, is never to let the glaſſes remain upon theſe plants when the ſun ſhines very hot, eſpecially if their leaves ſpread ſo as to preſs againſt the ſides of the glaſs; for the moiſture which ariſes from the ground, together with that which proceeds from the perſpiration of the plants, has, by being detained upon their leaves, frequently been ſo heated by the next day's ſun, powerfully heightened by means of the glaſs, as abſolutely to ſcald all the larger leaves, to the great detriment of the plants; and ſometimes ſo as to affect even the whole of the plants, in ſuch manner that they have not been worth cultivating afterwards.

If the plants have thriven well, ſome of them will begin to fruit by the end of April. It will therefore be neceſſary then to look them over carefully at leaſt every other day, and where the flower appears plainly, to break down ſome of the inner leaves, ſo as to cover it and ſhade it from the ſun, which would otherwiſe ſoon render it yellow and unſightly. When the flower is full grown, which is known by the gapping and parting of it's ſurface, as if it would run to ſeed, the whole plant ſhould be drawn out of the ground, and if it's head is wanted for preſent uſe, it may then be cut out of the leaves: but if it be deſigned for keeping, it ſhould be laid in a cool place, with it's leaves about it. This is much better than the ſlovenly method of thoſe who cut off the heads of colliflowers as they ſtand, and leave in the ground their then uſeleſs ſtalks, with perhaps ſeveral as uſeleſs leaves, which ſerve only to taint the air around them. The moſt proper time for drawing them, is early in the morning, before the ſun has exhaled any part of their moiſture: for thoſe that are gathered in the heat of the day, loſe their natural criſpneſs, and become tough.

The ſecond crop of colliflowers, which the gardeners near London call the great crop, is that which generally ſupplies the markets here in May, June, and July. The ſeeds for this are of a ſomewhat more backward kind than thoſe of the former, and they are alſo moſt commonly ſown four or five days later. The manner of ſowing them, and of managing the plants produced from them, is in all reſpects exactly the ſame as before directed for the early crop, until the end of October. From that time, the practice of the London gardeners, who carry on a great trade in this article. is as follows.

Upon a couch of dung, beaten down cloſe with a fork, in order to render it the more difficult for worms to pierce through it, they place a layer of good freſh earth about four or five inches thick.

The thickneſs of the dung is from ſix inches to a foot, according to the ſize of the plants; the ſmalleſt requiring moſt, to bring them forward. The plants are ſet in the mould of this bed at the ſquare diſtance of about two inches and an half from each other, and they are ſhaded and watered till they have taken new root. The number of theſe beds is proportioned to the quantity of the plants, and they are covered either with glaſs frames, or with hoops, over which mats, &c. are ſpread: but great care is taken not to keep theſe coverings cloſe, becauſe the warmth of the dung (for that which is uſed here muſt not have loſt the power of fermenting) will occaſion a conſiderable damp, which would greatly injure the plants, if it were pent in. When they have taken root, as much free open air as poſſible is given them, by taking the coverings off in the day time, whenever the weather permits, and raiſing them up with props at night, unleſs the air be froſty: for in this laſt caſe they are then ſhut down cloſe; and in very hard froſts the glaſs frames are covered with mats, ſtraw, pea-haulm, &c. Great caution is likewiſe uſed to guard the plants againſt heavy rain in the winter; and if any of their under leaves grow yellow, or decay, at that ſeaſon of the year, particular care is taken to pick them off in as mild a day as can be choſen; becauſe, if the weather ſhould prove ſo very bad as to occaſion a neceſſity of keeping the covers cloſe down for two or three days together, thoſe decayed leaves would render the incloſed air ſo hurtful to the plants, (then in a ſtate of great perſpiration, by reaſon of their cloſe confinement,) that numbers of them would ſoon be deſtroyed.

Early in February, if the weather is tolerably mild, they begin to harden theſe plants by degrees, in order to prepare them for tranſplantation.

The ground into which they are to be tranſplanted, beſides being quite open from trees, rather moiſt than dry, and well dunged and dug, as before directed, is, when managed in the moſt proper manner, ſown with radiſhes a week or a fortnight before the colliflowers are planted in it. Mr. Miller recommends this very particularly, for this excellent reaſon, that if there are not ſome radiſhes among them, and the month of May ſhould prove hot and dry, as it ſometimes is, the fly will ſeize the colliflowers and eat numbers of holes in their leaves, to the great prejudice, if not to the entire deſtruction, of theſe plants; whereas, if there are radiſhes upon the ſpot, the flies will take to them, and never meddle with the colliflowers ſo long as the others laſt. The gardeners near London, who are obliged to make the moſt of their ground, mix ſpinage with their radiſh ſeed, and thereby have a double crop between their colliflowers: but, that conſideration excepted, it may be beſt to ſow but one crop with the colliflowers, that ſo the ground may be cleared in due time.

Towards the middle of February, if the ſeaſon is good, they begin to plant theſe colliflowers out in rows. The uſual method of thoſe who raiſe a variety of other crops between them is, to leave a ſpace of four feet and an half between the alternate rows, of two feet and an half between the intermediate ones, and of twenty ſix inches from plant to plant in the rows. About the end of May, or beginning of June, by which time the radiſhes and ſpinage are cleared off, they ſet ſeeds of cucumbers for pickling along the middle of the wide rows, at the diſtance of three feet and an half aſunder; and in the narrow rows they plant winter cabbages twenty ſix inches apart, ſo that each of theſe ſtands exactly in the middle of the ſquare between four colliflowers, and therefore has ample room to grow in after the colliflowers are gone. By this means there is a ſucceſſion of crops during the whole ſeaſon.

Some raiſe a third crop of colliflowers, by making a ſlender hot-bed in February, ſowing the ſeeds thereon, ſifting light mould over them to the thickneſs of about a quarter of an inch, and then covering the whole with glaſs frames. When the plants have four or five leaves, they remove them into another hot bed, where they plant them about two inches aſunder every way, and in the beginning of April they harden them by degrees, to fit them for being tranſplanted again. This is moſt commonly done in the middle of that month, at the diſtances before-mentioned for the ſecond crop, like which this is from thenceforth managed in every reſpect. If the ſoil in which theſe colliflowers are planted is light, and the ſeaſon likewiſe reaſonably moiſt and cool, they will produce heads fit to be cut about a month after the ſecond crop is gone.

The table may continue to be ſupplied with colliflowers after Michaelmas, through the months of October and November, and often during a great part of December, if the ſeaſon be favourable, and the ſoil good; by ſowing them about the twenty third of May, and tranſplanting them in the manner before mentioned.

The gardeners about London have almoſt wholly laid aſide the troubleſome, expenſive, and little uſeful practice of watering their colliflower plants in the ſummer; and Mr. Miller very juſtly blames thoſe who ſtill perſiſt in that old method; becauſe, "if the ground is ſo very dry as not to "produce tolerable good colliflowers without water, "it ſeldom happens that watering of them renders "them much better; and when once they have

" been watered, if it is not conſtantly continued,
" it had been much better for them if they never
" had any; as alſo, if it be given them in the
" middle of the day, it rather helps to ſcald them;
" ſo that, upon the whole, if care be taken to
" keep the earth drawn up to their ſtems, and
" clear them from every thing that grows near
" them, that they may have free open air, they
" will be found to ſucceed better without than
" with water, where any of theſe cautions are not
" ſtrictly obſerved."

That deep and repeated ſtirrings of the earth around colliflowers, after their laſt tranſplantation, will, alone, keep the ſoil ſufficiently moiſt; and that they may be raiſed in great perfection, without any dung at all, by only obſerving the principles of the horſe hoeing huſbandry; is very manifeſt from M. de Chateauvieux's beforementioned experiment [f], than which there cannot be a ſtronger proof of the rectitude of Mr. Miller's opinion here. If this experienced gardener had but directed good digging about their roots, inſtead of drawing the earth up to their ſtems, his method would have been complete.

*Parſley* is multiplied only by it's ſeeds, which are ſmall, of a greeniſh grey colour, a little bending inward on one ſide, and ſtreaked all over. They ſhould be ſown, in fine mould, as early in the ſpring as the froſts are over, becauſe they ſeldom ſprout in leſs than ſix weeks. The ſorts generally cultivated in the kitchen garden are, the common parſley, the curled parſley, and the long rooted parſley.

The two firſt of theſe are uſually ſown in drills, along the edges of the borders, becauſe it is much eaſier there to keep the plants clear from weeds, and to cut them when wanted, than if they were ſcattered promiſcuouſly over a wider ſpace of ground. The larger rooted parſley ſhould, after it is come up, be thinned ſo as to leave a ſpace of ſome inches between the plants in each row: for this ſort ſhould always be ſet in regular rows, at ſufficient diſtances, to afford room for digging or otherwiſe ſtirring of the earth between them, in order to promote the increaſe of it's roots, for which only it is cultivated in the garden. The largeneſs of it's leaves, and their much darker green, eaſily diſtinguiſh it from the common parſley, independant of it's ſix times bigger roots. If rightly managed, theſe will be fit to draw in July. The markets in Holland are ſtored with bunches of them, as ours are with young carrots, in the ſummer; and indeed, thanks to Mr. Philip Miller, who firſt propagated this ſpecies here, the good markets in London are not now without them, in their proper ſeaſon. The method and advantages of raiſing each kind of parſley in the field, for the uſe of cattle, have been treated of in my former volume [§].

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[f] See *Vol.* III. *p.* 201.

To preſerve the curled parſley unmixed, it's ſeeds ſhould be carefully ſaved from plants whoſe leaves are well curled; for theſe will always produce the ſame ſpecies: but the only way to do this effectually, is to ſeparate the plain-leaved from the curled, by taking them up, as ſoon as their difference is diſcernable, and leaving only the ſort that is deſired: for it is impoſſible to know the one from the other by their ſeeds.

The curled parſley is ſo remarkably different from hemlock, that it is by much the ſafeſt ſort to ſow by thoſe who are at the leaſt loſs to diſtinguiſh that poiſonous weed from the common plain-leaved parſley.

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[§] See *Vol.* III. *p.* 178—180.

*Smallage*, or water parſley, which is the plant that phyſicians indicate when they preſcribe *Apium* (for the common parſley is what they call *Petroſelinum*) grows naturally by the ſides of brooks and ditches in many parts of England, and is rarely cultivated in gardens. Thoſe, however, who are fond of it in their pottage, may raiſe it in a moiſt ſoil, either by ſlips, or from ſeeds ſown in March. This ſeed is reddiſh, and pretty big, of a roundiſh oval ſhape, a little more full and riſing on one ſide than on the other, and ſtreaked lengthwiſe.

*Spinage* requires a rich, light, and well looſened ſoil. It is propagated by its ſeeds only, of which there are two ſorts, namely, the rough and prickly, which produces the prickly ſpinage with arrow-pointed leaves, and the ſmooth, from which ſprings the ſpinage with oblong oval leaves.

The ſeeds of the firſt of theſe kinds, which is by much the hardieſt, and therefore fitteſt to be cultivated for winter uſe, ſhould be ſown upon an open ſpot of ground, in Auguſt, juſt before a ſhower of rain, if it can luckily be ſo timed: for if the ſeaſon ſhould prove dry for a long while after the ſowing, many of them will not ſprout at all, and the plants of thoſe that do grow will come up ſo irregularly, that half the crop will frequented be loſt. It therefore is highly adviſable to water theſe ſeeds within two or three days after their being ſown, if rain does not fall in the mean time.

When the plants begin to be ſtrong, the ground on which they grow ſhould be well hoed, to deſtroy the weeds, and to thin the plants to the diſtance of three or four inches aſunder. This, like all other hoeings, ſhould always be performed in dry weather, the more effectually to kill the weeds: or, if it be rainy, they ſhould be carried off the ground as ſoon as they are cut up, to prevent their taking freſh root: for if many of them ſpring up, and the ſeaſon prove wet, they will ſtifle the plants of ſpinage, and make them rot. A ſecond careful hoeing is therefore neceſſary in about a month or five weeks after the firſt; and with the help of this the ſpinage will begin to be fit for uſe by the end of October. The beſt way of gathering it is, to crop off only the largeſt outer leaves, and to leave the middle ones to grow bigger: for by this means a regular ſupply may be had during the whole winter, and even till the ſubſequent ſpring ſowing ſhall have produced plants large enough for uſe, which generally is in April. The winter ſpinage will alſo then be ready to run up, and ſhould therefore be entirely cleared off, unleſs a parcel be left for ſeed, if wanted. But if early cabbages, which will want earthing up, have been planted among this ſpinage, as is the uſual practice of the gardeners about London, a ſeparate ſmall ſpot of ground ſhould be allotted purpoſely for ſowing ſome of this ſpinage for ſeed, without any other plants among it, and to cut up all the remains of the other winter crop as ſoon as the ſpring ſpinage is fit for uſe.

The oblong oval leaved ſpinage, commonly called plantain ſpinage, which has thicker leaves and more ſucculent ſtalks than the former ſort, is ſown in the ſpring, likewiſe upon an open ſpot of fine rich earth. The London gardeners, who always endeavour to have as many crops in a ſeaſon as they poſſibly can, generally mix radiſh ſeeds with thoſe of the ſpinage which they ſow at this ſeaſon: but the beſt way for thoſe who have ground enough, is to ſow their ſpinage ſeeds alone. This crop muſt be hoed, cleared from weeds, and thinned, in the manner before directed for the winter ſpinage; and when the plants, which were at firſt left three or four inches aſunder, have grown ſo as to meet, it will be right to cut them out here and there for uſe, and to thin them in this manner, as they are wanted for the table, till thoſe that are left, ſtand eight or ten inches aſunder. The thinnings in the mean time will give the remaining plants room to ſpread; and if, after this laſt, the ground between them is well ſtirred to a good depth, and kept perfectly clear from weeds, this ſort of ſpinage will frequently produce leaves as large as thoſe of the broad leaved dock, and extremely fine.

A ſucceſſion of ſpinage may be had throughout the whole ſeaſon, by ſowing it every three weeks, from about the middle of January to near the end of May; only obſerving, that the earlieſt ſowings muſt be upon the naturally drieſt ſoils, and that the lateſt ſhould be thinned moſt at their firſt hoeing, becauſe the remains of the former crops will furniſh a ſupply till theſe are full grown, and the plants will not be ſo apt to run up to ſeed when they ſtand at a diſtance from each other, as when they are cloſe together.

In order to have good ſeeds of ſpinage, each particular ſort ſhould be ſown by itſelf, in an open ſpot of rich and well dug ground. This ſowing ſhould be in February, as ſoon as the danger of froſt is over; and when the plants are come up, they ſhould be thinned with a hoe till they are ſix or eight inches aſunder every way. All weeds ſhould at the ſame time be carefully cut up and carried off: and in about three weeks or a month after this, the plants ſhould be hoed and thinned a ſecond time. Their diſtance from each other ſhould then be enlarged to at leaſt twelve or fourteen inches: for they will cover the ground very ſufficiently after they have ſhot out their ſide branches. Particular care is requiſite at this time to keep them very clear from weeds; becauſe theſe would make the plants of ſpinage run up weak, and thereby greatly injure them.

Mr. Miller is here extremely judicious in his directions for the farther management of ſpinage intended for ſeed. " When the plants, ſays he[h], " have run up to flower, you will eaſily perceive " two ſorts among them, *viz.* male and female. " The male will produce ſpikes of ſtamineous " flowers, which contain the farina, and are abſolutely neceſſary to impregnate the embryos of " the female plants, in order to render the ſeeds " prolific. Theſe male plants are, by the gardeners, commonly called ſhe ſpinage, and are " often, by the ignorant, pulled up as ſoon as they " can be diſtinguiſhed from the female, in order, " as they pretend, to give room for the ſeed bearing to ſpread: but, from ſeveral experiments " which I have made on theſe plants, I find that, " where-ever the male plants are entirely removed " before the farina is ſhed over the female plants, " the ſeed which they produce will not grow, ſo " that it is abſolutely neceſſary to leave a few of " them in every part of the ſpot, though a great " many may be drawn out where they are too " thick; for a ſmall quantity of male plants (if " rightly ſituated) will be ſufficient to impregnate a great number of female, becauſe they " greatly abound with the farina, which, when " ripe, will ſpread to a conſiderable diſtance, when " the plants are ſhaken by the wind."

When the ſeeds begin to ripen, they muſt be guarded from birds; and when they are thoroughly ripe, which is known by their changing their colour, and beginning to ſhed, the plants ſhould be drawn up, and ſpread upon cloths, for a few days, to be completely dried by the heat of the ſun. That they may be perfectly ſo, they ſhould be turned every other day; and when they are quite dry, they ſhould be threſhed out, well cleaned, and laid up in a dry place, where mice, which are exceſſive fond of this food, cannot come at them.

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[h] *Gardener's Dict.* Art. SPINAGIA.

## *ARTICLE* III.

### *Of Legumes.*

*BEANS* of all kinds thrive beſt in a rich, ſtiff, deep, and well looſened ſoil, in which they ſhould be planted at the depth of from five to ſix inches, according to their ſeveral ſizes. The ſorts proper for the kitchen garden are, the Mazagan, the early Portugal, the ſmall Spaniſh, the broad Spaniſh, the Sandwich, the white and black bloſſomed, and the Windſor bean.

The Mazagan, which is brought from a Portugueſe ſettlement of that name, on the coaſt of Africa, juſt beyond the ſtreights of Gibraltar, is the firſt and beſt ſort of early beans. If theſe are ſown in October, in a warm ſituation, under a wall, pale, or hedge, and their plants are carefully kept clear from weeds, and earthed up when they are advanced in growth, they will produce fruit fit for the table by the beginning of May: but as their ſtems are very ſlender, and the morning froſts are ſometimes ſevere in the ſpring, it will be right to ſupport them by ſtrings extended along their rows, and faſtened to ſtakes, to prevent their dropping to the ground when the froſt has bitten them much: for that would at leaſt greatly retard their growth, or even, perhaps, be a means of their never riſing again. To ſupport them thus at a little diſtance from the fence under which they have been planted, is, for the reaſons before aſſigned [i], far better than drawing them cloſe up to it, as moſt writers adviſe, eſpecially if it be a wall. Theſe beans bear plentifully; but they ripen ſo nearly together, that more than two gatherings can ſeldom be had from the ſame plants. In the place of their natural growth, they are much ſmaller than our horſe-bean; but after two years culture with us, they become much larger, and do not ripen ſo ſoon as before. This is called degenerating.

The early Portugal bean, is the ſort which the gardeners about London moſt commonly ſow for their firſt crop: but it is not near ſo well taſted as the Mazagan, and therefore ſhould not be uſed where that can be had. From it's likeneſs to the ſeed of the Mazagan when gathered here after it's firſt crop in this county, it ſeems to be the ſame ſort ſaved in Portugal.

The ſmall Spaniſh bean comes in ſoon after the Portugal, to which it is preferable, becauſe it is ſweeter.

The broad Spaniſh bean ſupplies the table ſoon after the former is gone, and a little before the common ſorts. It bears well, and therefore is frequently planted.

The Sandwich bean ſucceeds the broad Spaniſh, and is almoſt as large as the Windſor; but, being hardier, it is generally ſown a month ſooner. This alſo is a plentiful bearer.

The Toker bean is fit for gathering at about the ſame time as the Sandwich, and, being a great bearer, it now is much cultivated.

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[i] See *p.* 20.

The white and the black bloſſomed beans are alſo much eſteemed. The former are remarkably ſweet, and almoſt as green as peas, when they are boiled: but both theſe ſorts are very apt to degenerate, if their ſeeds are not ſaved with great care.

The Windſor bean is the beſt of all for the table. When planted in a good ſoil, and allowed ſufficient room, it will yield great plenty of very large ſeeds; and when it is gathered young, it is ſweeter and better taſted than any other ſort: but great care ſhould be taken to pull up all ſuch plants as are not perfectly right, and may chance to be intermixed, and afterwards to ſeparate all the good beans from the bad, when they are taken out of the pods.—As this bean will not bear the froſt ſo well as moſt of the other ſorts do, it is not often planted before Chriſtmas; and it is generally uſed for the great crop, which is gathered in June and July.

In the uſual practice of gardeners, all the early beans are planted in warm borders, near walls, pales, or hedges; and thoſe which are intended for the firſt crop are generally ſet in a ſingle row, pretty cloſe to the fence: but, beſides the reaſon before given [k] for not placing, or drawing up, any plants of this kind too cloſe to a wall, it is doubly injudicious here, becauſe the beans, which ſend forth very many and long roots, which are known to be great impoveriſhers of the land, and which form a conſiderable ſhade after they are grown up, will certainly do more hurt to the fruit trees before which they are planted, than all their own crop can ever be worth. It therefore is much better to run reed hedges acroſs the quarters of the kitchen garden, and to plant the early beans and peas under them: for they will there be more ſecurely, as well more conveniently, ſheltered from froſt, and may be drawn up towards them, without any danger, as they increaſe in their growth.

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[k] *Page* 20.

Thoſe beans which are planted early in October, will come up before the middle of November. As ſoon as they are about two inches high, the earth around them ſhould be carefully hoed up to their ſtems; and this ſhould be repeated two or three times, as they advance in height, in order to protect thoſe ſtems from the froſt. If the winter be ſevere, it will be proper likewiſe to cover theſe beans with peas-haulm, fern, or ſome other light ſubſtance, as a ſtill farther ſecurity againſt the rigour of the ſeaſon: but this covering muſt always be taken off in mild weather; or it will make the plants run up tall and weak, and conſequently prevent their bearing well. The froſt is alſo prevented from penetrating to their roots, by covering the ſurface of the ground with tanner's bark.

When the beans are about a foot high, which they will be early in the ſpring, they ſhould be drawn up as cloſe as poſſible to the reed hedge before mentioned, by a packthread run along their outſide. This ſituation will ſhelter them from the morning froſts, which are frequently ſo ſevere in April, as to lay flat on the ground ſuch beans as are not thus guarded. At this time too, all ſuckers which proceed from their roots ſhould be carefully taken off; or they will retard the growth of the plants, and hinder their fruiting early. When the bloſſoms of the beans begin to open toward the bottom of the ſtalks, the tops of the ſtems ſhould be pinched off, in order to make the firſt pods ſtand, and thereby forward the product of the plants. If theſe rules are well obſerved, and if the beans are kept clear from weeds and other plants of any kind, there will be little danger of their ſucceeding.

It will, however, be right, in order to guard ſecurely againſt accidents which may happen to theſe very early beans, to plant a ſecond crop of them about three weeks after the firſt, and to repeat this at the end of every three weeks, or month, till February: obſerving, that ſloping banks, diſtant from a hedge, will ſuffice for thoſe which are not planted before the end of November, or beginning of December; becauſe they will not appear above ground before Chriſtmas, even though the weather ſhould be mild, and therefore will not be in ſo much danger as thoſe that were ſet earlier, eſpecially if the ſurface of the ground be covered with tan, to keep out the froſt.

The later crops of beans ſhould be planted about every fortnight, from February to the middle of May, after which laſt time it generally is too late to ſet theſe legumes, unleſs the land be very ſtrong and moiſt: for the late crops of beans raiſed on warm, dry, and light ſoils ſeldom eſcape the black inſects, commonly called black dolphins, which fix on and cover all the upper part of their ſtems, and ſoon make them decay.

The principal cautions neceſſary to be obſerved in regard to theſe latter crops are, firſt, to plant the lateſt in the moiſteſt and ſtrongeſt ground, for theſe ſeldom come to much in dry places, unleſs the ſummer chance to prove wet; ſecondly, to keep them very clear from weeds and other plants, which would otherwiſe exhauſt their nouriſhment; thirdly, to keep earthing them up, if they are cultivated in the common way, or, which is infinitely better, to ſtir the earth thoroughly, deep, and frequently between them, according to the practice of the new huſbandry [l], and to pinch off their tops when they begin to bloſſom, in the manner, and for the reaſon before mentioned; fourthly, to ſet the earlieſt planted the cloſeſt together, in order to allow for the failure of many of them; and fifthly, to allow the largeſt beans the greateſt ſpace to grow in. Mr. Miller, who, from his own experience, judiciouſly adviſes the ſtricteſt attention to theſe rules [m], allows for a ſingle row of the firſt and ſecond planted beans, which never are of the large ſort, two inches between the ſetting of each bean, and three inches for thoſe of the third and fourth planting; and if either of theſe are planted in rows acroſs a bank, he would have the ſpaces between the rows not be leſs than three feet each. For the Windſor bean, the diſtance between the rows ſhould not be leſs than four feet, and theſe beans ſhould be planted five or ſix inches aſunder in the rows, if they are to yield their greateſt produce [n].

To ſave the ſeeds of garden beans, a number of rows, in proportion to the quantity deſired, ſhould be ſet apart for that purpoſe. Theſe ſhould be managed in the ſame way as thoſe that are intended for the table, excepting that none of the beans here ſhould be gathered; for the growth of an after-crop never is ſo large and fair as that of the firſt; nor ſhould two different ſorts, or even two varieties of the ſame ſort, be ſuffered to ſeed in the ſame place, leſt they ſhould be hurt by the intermixing of their farina. Thoſe who would preſerve their ſorts quite pure, ſhould be very attentive to this caution; and for the early kinds in particular, they ſhould ſave for ſeeds the fineſt of thoſe plants which came up ſooneſt: though few people chooſe to do this, becauſe they are then moſt valuable.

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[l] See *Vol.* II. *p.* 380.

[m] *Gardener's Dict.* Art. FABA.

[n] See again *Vol.* II. *p.* 380.

When the ſeeds are quite ripe, the ſtalks ſhould be pulled up, and ſet upright againſt a ſunny fence, to dry. Care ſhould be taken to turn them there every ſecond or third day, that they may dry equally; and when that is done, they may be threſhed out, cleaned, and laid by for uſe: or the ſtalks thus dried, with the beans in their pods, may be ſtacked up in a barn, or any other dry place, in order to their being threſhed out at a more leiſure time. But if the quantity be only for private uſe, and not for ſale, the ſeeds may ſoon be picked out by hand, by which means the danger of their being bruiſed by the flail will be avoided. Which ever method is uſed, it will be right to cull out all the faireſt ſeeds, for they will produce the fineſt plants. The refuſe may be given to cattle.

Beans, like all other vegetables, degenerate, if the ſucceſſive produce of the ſame ſeeds is ſown long in the ſame ground; nor will they, in a few years, yield ſo plentifully as at firſt. The beſt way therefore is, to change the ſoil and ſpecies as often as may be; for this method will preſerve the quality of the bean, and the quantity of the crop.

*Kidney-beans* delight in a warm, light, fertile, and pretty dry ſoil. They are too tender to be ſown in open ground before the middle of April; becauſe if the weather ſhould prove cold and wet, their ſeeds, from which only they are raiſed, would ſoon rot; or if the mornings ſhould be froſty, as they frequently are even after the beginning of May, the young plants would be in great danger of being deſtroyed. The beſt way, therefore, to have theſe beans early, is, if there be not a conveniency of frames for raiſing them, to ſow the ſeeds about the latter end of March, or the beginning of April, in pretty cloſe rows, upon a gentle hot-bed; but juſt warm enough to bring up the plants. This bed ſhould be arched over with hoops, in order to it's being covered with mats every night, or in bad weather; and when the plants have begun to put forth their trifoliate leaves, they ſhould be taken up carefully, and tranſplanted into well dug and well ſheltered borders of good mould. If they are tranſplanted in a dry ſeaſon, they ſhould be watered a little, to forward their taking root. Their culture afterwards is the ſame as for thoſe that are ſown in the open ground; but it is to be obſerved, that the tranſplanted beans ſeldom grow ſo ſtrong as thoſe which have not been removed, nor do they bear ſo long: they will, indeed, be fit for gathering at leaſt a fortnight earlier.

The ſorts of kidney-beans moſt uſually cultivated for early crops, are the ſmall white dwarf, the black dwarf, and the liver-coloured bean. Theſe are, particularly, the fitteſt to be raiſed on hot-beds, or, for want of them, on fine warm borders; and as their ſtalks never grow very long, their ſeeds may be planted much cloſer together than thoſe of the larger kinds; nor will they want much ſupport. They ſhould be ſown about the middle of April, and, if they eſcape the morning froſts before-mentioned, they will be fit for uſe a fortnight ſooner than the other ſorts.

The manner of planting them in the open ground is, to make ſhallow furrows, with a hoe, about three feet aſunder; to drop the ſeeds into each of theſe, about two inches apart; and then to draw the earth over them with the head of a rake, ſo as to bury them about an inch deep. If the ſeaſon be favourable, the plants will appear in about a week's time; and as ſoon as they have raiſed their heads quite upright, a little earth ſhould be drawn gently over their ſtems, when the ground is dry, to prevent their being injured by ſharp winds: but in the doing of this, care ſhould be taken not to cover their ſeed leaves. The only care requiſite afterwards is to keep them clear from weeds till they produce their pods. Theſe ſhould be gathered carefully twice or thrice a week: for if they are left but a little too long upon the plants, they will become hard and ſtringy, the beans in them will be too large for eating, and the plants themſelves will be greatly weakened thereby.

The Batterſea kidney-bean is ſomewhat earlier than the Canterbury; but this laſt continues bearing much longer. Both of theſe are better taſted than either of the three former ſorts; but they are very tough and ſtringy when they begin to be large.

The trading gardeners around London frequently cultivate two or three other ſorts of pretty early kidney-beans, becauſe theſe growing with erect ſtalks which want no ſupport, and not putting out any twining tendrils, require the leaſt care and trouble, and at the ſame time produce the greateſt quantity of pods: but they are inferior to all the reſt in goodneſs. The pods of one of theſe ſorts, in particular, which is that with black and white ſpeckled ſeeds, have a rank flavour, and become ſoft and mealy, when boiled.

The ſecond crop of kidney-beans ſhould be ſown about the middle of May. The beſt ſorts to obtain this from, are the ſcarlet bloſſomed, which, if properly ſupported, will riſe to the height of twelve or fourteen feet; a white bean of the ſame ſize and ſhape, which ſeems to be only a variety of the ſcarlet; and the large white Dutch kidney-bean, which grows as tall as either of the former, and therefore muſt, like them, be well ſupported, to prevent it's trailing upon the ground, where it would ſoon be ſpoiled. The moſt delicate of all are the ſcarlet bloſſomed, and the white variation of the ſame ſpecies. Theſe are alſo the hardieſt: for though they do not come ſo early as ſome of the dwarf kinds, (nor will they be a fortnight later than the Batterſea kidney-bean, if ſown in the ſame ſoil and ſituation,) they will begin to bear plentifully before the early ſorts are over, and will continue ſo to do till the autumnal froſts ſtop their vegetation. They are therefore preferable to every other ſort: but if there be any difference, in point of goodneſs, between the ſcarlet and the large white, it is in favour of the former; becauſe it's pods are ſeldom ſtringy at any time. They alſo boil greener, and are better taſted, even when old, than the young pods of the early kinds of this plant.

Theſe largeſt ſorts of kidney-beans ſhould be planted ſix or eight, or even more inches aſunder, in rows at leaſt four feet diſtant from each other: for as they grow very tall, the ſun and air will otherwiſe be excluded from the middle rows. This will alſo leave very ſufficient room for ſtirring of the earth between them according to the principles of the new huſbandry, by obſerving of which we have already ſeen [q] that M. Eyma, one of M. Duhamel's correſpondents, had not only a much greater crop of theſe beans, than any that were raiſed in the common way; but likewiſe much finer than he had ever ſeen before. When theſe plants are about four inches high, poles eight or ten feet long ſhould be thruſt into the ground by the ſide of them: for they will twirl themſelves around them, quite up to their top, and produce plenty of fruit from the ground upward.

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[q] See *Vol.* II. *p.* 376 and 377.

To ſave the beſt ſeeds of theſe plants, a few of the fineſt rows of them ſhould be left ungathered during the whole ſeaſon: for the latter pods never are ſo long and handſome as the firſt growths, nor do they yield equally good ſeed. When they are ripe, the plants ſhould be pulled up in a dry ſeaſon, and ſpread abroad in the ſun, to dry: their beans ſhould then be threſhed out, and kept in a dry place.

The Germans, French, Dutch, and Flemiſh, preſerve great quantities of the large white Dutch kidney-beans, dry, for winter uſe. They ſtew them, and cook them ſo as to make a tolerably good and heartening diſh. It is a principal part of the food of the common people in Roman Catholic countries, during Lent.

*Lentils*, or *Tills*, as they are frequently called in many parts of England, are alſo a conſiderable, and not a bad lenten food. The beſt times for ſowing them are, March for dry land, and April for wet. They ſucceed beſt when ſown in drills, in the ſame manner as is practiſed for peas, and their increaſe will be prodigious on a middling, or rather pooriſh ſoil; for they will grow ſo luxuriant in rich land, that they will not ſeed well. The rows ſhould be ſufficiently diſtant to admit of hoeing between them, as well to ſtir the ground, as to keep the plants clear from weeds: for though lentils are hardy enough in other reſpects, as are all kinds of the vetch, of which this is a ſpecies, they would be ſtarved if many weeds were to get above them, as they might ſoon do if theſe plants, the common ſort of which ſeldom riſes above a foot and an half high, were to be neglected for any length of time. The French lentil is twice as big as the common ſort, both in plant and ſeed. Lentils, when ripe, are reaped, threſhed out, and preſerved for uſe, in the ſame manner as peas.

Their pods ſeldom contain more than two or three ſeeds. Theſe ſeeds are round, ſmooth, and flat, but thicker in the middle than at the ſides; and they will become exceedingly hard, if they are kept long in a dry place. The white lentil is moſt eſteemed for the food of men; the yellow being cultivated chiefly for cattle, and conſequently in the field, in which light this plant has been treated of in my firſt volume[p].

*Peas* grow quickeſt and largeſt in the richeſt mould, but a more ordinary ſoil yields the tendereſt and ſweeteſt. The beſt manner of ſowing them is in drills, ſufficiently diſtant to afford proper room for hoeing, digging, or otherwiſe ſtirring the ground between them: for we have already ſeen[q] how very much theſe plants are benefited by being managed according to the principles of the new huſbandry, which ſhould therefore with theſe, as with all other vegetables, be practiſed with a ſpade, where a plough, or horſe-hoe cannot be uſed. The diſtance between the rows of peas ſhould therefore be proportioned to the ſize to which they grow. The channels in which they are ſown ſhould be about two inches deep; and the quickeſt and moſt regular way to perform this work is, to draw a ſmall hoe, directed by a line, along the ſurface of the ground, ſo as to open a drill, then to ſcatter the ſeeds in this furrow, and to earth them over with the help of a rake. By this means they will be well and equally covered; which is eſſentially neceſſary, becauſe if any of them lie above ground, they will attract mice, rooks, pigeons, and other birds, which will then ſoon find out the reſt, and deſtroy the whole plantation. The chief trouble after ſowing them is, to ſtick the larger ſorts which require ſupport, to keep the plants clear from weeds, and to earth them up; both which laſt parts of their culture are very eaſily, readily, and effectually executed, when a ſmall plough can be introduced between the rows.

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[p] See *p*. 481.

[q] *Vol.* I. *p*. 471, 472. and *Vol.* II. *p*. 375, 376.

The names of the principal ſorts of garden peas now cultivated in England, and the order in which they naturally become fit for gathering, are as follow, *viz.* the golden Hotſpur, the Charlton Hotſpur, the Reading Hotſpur, the Maſter's Hotſpur, the Eſſex Hotſpur, the Dwarf pea, the Sugar pea, the Spaniſh Morotto, the Nonpareil, the Sugar Dwarf, the Sickle pea, the Marrowfat, and the Roſe, or Crown pea: for the Rouncival, the common white pea, the grey pea, the pig pea, and ſome other large winter peas, as they are commonly called, ſeldom find a place but in the field, where their moſt proper management has been directed in my firſt volume[r]. But I muſt here obſerve, that ſeveral of the abovementioned, which gardeners and ſeed-men have diſtinguiſhed by different appellations, are, in fact, only ſeminal variations, which will degenerate into their original ſtate in a few years, if they are not very carefully managed. The only way to prevent this, is to *rogue* them, as the gardeners term it, that is to ſay, to examine attentively thoſe which are intended for ſeeds, at the time of their beginning to flower (but before the flowers are open), and to draw out all the bad plants from among the good ones, that the farina of the former may not impregnate the latter, and thereby make them change. It is chiefly owing to this particular care, and to the ſelecting of thoſe plants which bloſſom earlieſt, that the culture of peas has been very greatly improved of late years around this metropolis, and that, from a continuation of the ſame induſtrious endeavours to bring it to a ſtill greater perfection, we may hope to ſee yet forwarder varieties of this moſt uſeful ſpecies of pulſe.

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[r] See *p.* 461—473.

The Hotſpur pea is, naturally, the earlieſt of all, and therefore I have named it firſt: but the gardeners about London raiſe, by art, from the dwarf pea, tranſplanted into a hot-bed, a crop which anticipates the ſpontaneous growth of the other. To effect this, they ſow their dwarf peas in warm borders, under walls or hedges, about the middle of October; and when the plants are riſen, they draw the earth up gently around their ſtems, to protect them from the froſt. They let them remain where they where ſown till the latter end of January, or the beginning of February (ſtill continuing to earth them up from time to time, as they advance in growth, and covering them with dry haulm, or ſtraw, in caſe of ſevere froſt), and then remove them into a hot-bed made of good, new, well fermenting dung, properly mixed, that the heat may not be too great. This dung is laid from two to three feet thick, according as the ſeaſon is more or leſs advanced; it is covered with ſix or eight inches deep of light and freſh, but not too rich, earth; the frames, about two feet high at their back, and fourteen inches deep in front, are then put on, and covered with their glaſſes, which are propped up every day, during three or four days, to let the riſing ſteam paſs off; and when the bed is become of a moderate temperature, the plants are taken up as carefully as poſſible, to preſerve the earth about their roots, and planted in it about an inch aſunder in rows two feet diſtant from each other. They are then watered a little and ſhaded, till they have taken root, and aired whenever the ſeaſon is favourable, leſt they ſhould be drawn up very weak, grow mouldy, and decay. Their ſtems are alſo earthed up as they advance in height, and they are kept perfectly clear from weeds. This firſt watering ſhould be gentle, and dealt out ſparingly; for too much of it would make them grow rank, and ſometimes rot them off at their ſhanks, juſt above the ground. If the weather becomes very hot, the glaſſes are covered with mats in the day time, to ſcreen the plants from the too great violence of the ſun; and when they begin to fruit, they are watered oftener and more copiouſly than before; for they have nearly done growing by that time, and refreſhing of them frequently will make them produce the greater number of pods.

The dwarf pea is preferred for this purpoſe, becauſe it is more eaſily confined within frames, than any other ſort. The reaſon for ſowing it in the common ground, and afterwards tranſplanting it into a hot-bed, is, to check its growth, and thereby make it bear the more in a ſmaller compaſs.

The Hotſpur, of which the ſorts before enumerated differ very little from each other, except in the forwardneſs of their fruit, in which the golden and the Charlton are earlieſt, ſucceeds the hot-bed crop of the dwarf pea. But it is neceſſary to obſerve here, that both theſe kinds of hotſpur peas are particularly apt to degenerate, and become later in their podding, if they are cultivated in the ſame ground for three or four years running: wherefore the beſt way is to change their ſeeds annually, and always to prefer ſuch as come from a colder ſituation and a poorer ſoil, than the place where they are to be ſown, for theſe will be earlieſt in the ſpring; and if they are procured from a diſtant part, it will be ſo much the better.

Theſe peas muſt alſo be ſown in warm borders, about a fortnight after the former, that is to ſay, towards the end of October. When the plants are a few inches high, they ſhould be earthed up as before directed, to defend their ſtems from froſt; and if the winter be very ſevere, they ſhould be covered with haulm, or ſome other light covering: but this muſt be taken off as ſoon as the weather grows mild, leſt it ſhould draw them up weak and tender; and the weeding and earthing up ſhould be repeated as they advance in growth, but with care not to bury their leaves, for that might rot their ſtems, eſpecially in wet ſeaſons. Both of theſe works muſt be very carefully performed in the ſpring: and this is likewiſe the moſt proper time to kill the ſlugs, which, of all vermin, do the greateſt injury to peas. They lie all day in the hollows of the earth, near the ſtems of the plants, and come out in the night, to the ſometimes total ruin of the crop: they abound moſt in wet ſoils, and in neglected grounds over-run with weeds: for which reaſon they have the leaſt chance of finding ſhelter where the new huſbandry is well practiſed. Mr. Miller recommends[*], as the beſt method he could ever find to deſtroy them, to clear the ground thoroughly well around the plants, and there, very early in a fine mild morning, when theſe inſects are got abroad, to ſlake a quantity of lime and ſtrew it over the ground hot, and pretty thick. This will kill the ſlugs wherever it falls upon them, and will not do much hurt to the peas, if they be not over-loaded with it.

If this crop does well, it will immediately ſucceed that of the dwarf peas on the hot-bed: but leſt it ſhould miſcarry, it will be right to ſow two other crops, at the diſtance of about a fortnight or three weeks from each other. Theſe will

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[*] *Gardener's Dict.* Art. PISUM.

ſuffice till the ſpring, when more crops of the ſame ſort may be ſown every fortnight, and by this means the early peas will be continued through the ſeaſon.

About the middle of February, ſome of the Spaniſh Morotto, which is a great bearer, and a hardy pea, may be ſown in a clear open ſpot of ground, for the next uſe of the family. The rows of theſe, which are a larger kind, ſhould be four feet aſunder, and the peas ſhould be dropped at about an inch from each other in the drills.

To ſucceed theſe, another ſpot of ground ſhould be ſown about the end of February, either with the ſame, or any other large ſort of pea, and theſe ſowings ſhould be continued every fortnight, till the middle or latter end of May; only obſerving to allow diſtances proportioned to the ſize of the pea at it's full growth. Thus marrowfats, for example, ſhould not ſtand nearer than four feet and an half from row to row, and the roſe pea ſhould be at leaſt eight or ten inches aſunder in the rows: for all peas, (and the caſe is exactly the ſame in regard to every other plant) will run up in height, and yield but little fruit, if they are too much crowded.

When theſe larger ſorts of peas (which muſt be carefully weeded and earthed up as before directed) are grown about eight or ten inches high, ſome bruſh-wood ſhould be ſtuck up cloſe to them, to prevent their trailing upon the ground, which is very apt to rot theſe kinds in particular, eſpecially in wet ſeaſons: and another great advantage ariſing from their being thus ſupported, is that the air has then a free current between them, which will keep their bloſſoms from falling off before their time, and they will conſequently bear much better than they could if left trailing upon the ground. There will alſo, by this means, be proper room to hoe between the rows, and to paſs between them in order to gather the peas when they are ripe.

The marrowfat is the beſt taſted of all the large kinds of peas, and it will continue good till the end of Auguſt, if it be planted in a ſtrong ſoil. The other large growing ſorts may be raiſed for the common uſe of the family, becauſe they yield the moſt plentifully, and can endure the greateſt drought: but the early kinds are by far the ſweeteſt. It will therefore be well worth the maſter's while to ſee that a crop of theſe, and particularly of the early hotſpur, is ſown every fortnight, to ſupply at leaſt his own table during the ſeaſon.

All the dwarf peas yield plentifully, if the weather be not over dry; but they ſeldom continue to bear long. As they rarely ſurpaſs the height of one foot, or ſpread wider than ſix inches, about two feet and an half may be a ſufficient ſpace for weeding and ſtirring of the ground between their rows, in which they need not be ſet above an inch aſunder. Among theſe may be claſſed the Sickle pea, or Sugar pea, which is much cultivated in ſeveral foreign countries, but is ſeldom propagated here, except by curious gentlemen, for their own table. The pods of this pea are crooked and ill-ſhaped, but extremely ſweet when boiled with their unripe fruit in them, as is the general way of dreſſing them; for they have not any tough inſide ſkin, like the pods of other peas. I wonder that this ſort is not yet to be met with in our markets; unleſs the reaſon be, that the trading gardeners, who furniſh them, find that their profit will not pay for the trouble and expence of defending theſe peas from birds, which are ſo exceſſively fond of them, that they will ſoon devour a whole crop, if they are not very carefully kept off. If theſe peas are planted in April, they will be fit for gathering at Midſummer. Their pods, when they are very young, and their tendrils, have an agreeable acid flavour in ſallets; as have alſo the young tendrils of the hop and the vine.

A general rule to be obſerved in the planting of peas, is that the later they are ſown, the ſtronger and moiſter the ſoil ſhould be.

## *ARTICLE* IV.

### *Of Salleting.*

CHERVIL *(the Garden)* is an annual plant, raiſed only from it's ſeeds, which are black, very ſmall, and longiſh, and ſtreaked lengthwiſe. It will thrive in any ſoil or ſituation, and may be ſown either in drills, or broad caſt; but the former of theſe methods is the beſt, becauſe it greatly facilitates the weeding and cutting of the plants, whoſe culture is in all reſpects the ſame as that of the common parſley. The beſt time to ſow chervil is in the autumn, ſoon after it's ſeeds are ripe; for they grow beſt then, and the plants which riſe in that ſeaſon continue green all the winter; whereas thoſe which are ſown in the ſpring ſeldom come up at all; or if they do, their plants are almoſt ſure to wither and decay as ſoon as the warm weather ſets in. The plants of the autumnal ſowing flower in April, perfect their ſeeds ſoon after, and then die away. To ſave theſe ſeeds properly, their ſtalks ſhould be cut down when they begin to grow yellow.

Thoſe who are fond of this plant, as many are in ſoups in the winter and ſpring, may have a ſucceſſion of it very young, by ſowing it monthly during the ſeaſon: but whoever uſes it, ſhould be cautious not to miſtake the leaves of the annual *myrrhis* *, for this, as ſome of the Dutch ſoldiers who were in England in the year 1745 did, and were poiſoned thereby; and as happened ſince to the late Dr. Schomberg, through the ignorance or inattention of his cook. That excellent phyſician, indeed, cured himſelf.

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* It is proper here to give Mr. Miller's deſcription of the two ſpecies of this noxious plant[a].

" The *Chærophyllum floſculis omnibus fertilibus, caule æquali*, of Dr. Linnæus, *Sp. Plant.* 258. Chervil whoſe flowers are all fertile, and its ſtalks equal; which is the *Myrrhis ſylveſtris ſeminibus lævibus* of C. Bauhin, *P.* 160. Wild Myrrh with ſmooth ſeeds; grows naturally on the ſide of high-ways, and the borders of fields in moſt parts of England. It is frequently called cow-parſley, but for what reaſon I cannot ſay, becauſe there are few animals who care to eat it, except the aſs, for it is reckoned to have ſomething of the quality of Hemlock, but in a leſs degree. It is a weed that ſhould be rooted out from all paſtures early in the ſpring, for it is one of the moſt early plants in ſhooting, ſo that by the beginning of April, it's leaves are near two feet high. The ſeeds of this plant ſpread greatly over the ground, and as the roots are perennial, ſo they are often very troubleſome weeds to deſtroy."

I mention this ſort of the wild myrrh chiefly as a caution to huſbandmen: for the following is the ſpecies moſt apt to be fatally miſtaken for chervil.

This is Linnæus's " *Chærophyllum caule lævi, geniculis tumidis*, Sp. Plant. 258. Chervil with a ſmooth ſtalk, and ſwelling knots; and the *Myrrhis tuberoſa et nodoſa conyophillon*, Mor. Umb. 67, Tuberous and knotted myrrh with a hemlock leaf. It grows naturally in Hungary and Iſtria, and has a thick tuberous root, from which come forth ſeveral leaves, reſembling thoſe of wild chervil, which ſpread horizontally near the ground. The ſtalks riſe ſix or ſeven feet high, and are ſpotted with purple, and garniſhed with leaves of the ſame form as thoſe below. The knots at the joints of the ſtalks ſwell out on every ſide, at which is placed one of theſe divided leaves, and the ſtalks are terminated by ſmall umbels of white flowers, which are ſucceeded by long narrow ſeeds. It flowers in June, and the ſeeds ripen in Auguſt.

[a] *Gardener's Dict.* Art. CHÆROPHYLLUM.

*Ciboules* are propigated only by ſeeds, which, if ſown in March, will be ripe in Auguſt; and theſe are reckoned the beſt for ſaving, but they may be ſown in almoſt all ſeaſons. They differ from the onions, of which they are probably a degeneracy, in that they do not form bulbs at their roots, but ſhoot out ſeveral upright blades, and thoſe which produce the moſt of theſe are reckoned the beſt. Their culture is the ſame as that of onions, like which they muſt be thinned and well weeded. They will increaſe greatly, even in very dry ſummers, if they have been tranſplanted into beds of good earth, and thoſe beds well watered. The reddeſt, hardeſt, and mildeſt are the moſt eſteemed. Their peculiar quality is that of creating an appetite.

Mr. Miller, who has planted ſeveral times ciboules which he received from abroad, never found them differ from what is generally known here by the name of Welch onions: and for this very good reaſon he ſuppoſes them to be the ſame, though they paſs under different appellations [t].

*Cives* thrive beſt in a light rich ground. They are propagated by parting their roots, which never become bulbs, and the beſt time for ſetting them is in March: though they may be tranſplanted in the autumn, for they are very hardy; and in this caſe they will produce blades fit for uſe early in the ſpring. It is for theſe blades only, which ſeldom grow above ſix inches high, and are very ſmall and ſlender, that they are cultivated. They were formerly in great requeſt for mixing with ſallets in the ſpring, becauſe they are milder than the ciboule, or Welch onion. In good ground, they will laſt three or four years, without removing, or any other trouble than looſening the earth around them now and then, keeping them clear from weeds, and perhaps watering them a little ſometimes in great droughts.

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[t] *Gardener's Dict.* Art. CEPA.

*Clary* is propagated by ſeeds ſown in the ſpring, in good garden mould. When the plants are fit to remove, they ſhould be tranſplanted into beds, and there ſet at leaſt one foot aſunder. If they are planted in more rows than one, it ſhould be on an open ſpot of ground, at the ſame diſtance from each other, and with a ſpace of at leaſt two feet between the rows. After they have taken root, keeping them clear from weeds is the only farther culture uſually beſtowed upon them; but good ſtirring of the ground around them will greatly add to their increaſe. In the winter and ſpring following, their leaves, which are the only part uſed, will be fit for gathering; and in the enſuing ſummer, they will flower, ſeed, and decay; ſo that a ſucceſſion of young plants ſhould be raiſed every year. The common manner of cooking the leaves of clary, is to dip them in butter, and fry them. They are reckoned a great reſtorative. It is with the flowers of one of the ſpecies of this plant †, that the Dutch give a flavour to their Rheniſh wines which are brewed at Dort.

*Creſſes* are of various kinds: but the common Garden Creſs, the Indian Creſs, and the Water Creſs, are the ſorts uſed for the table.

The common *garden creſs*, pretty generally cultivated as a ſallet herb, is moſt eſteemed in the winter and ſpring, becauſe it is one of the warm kind. It is propagated by it's ſeeds only. If raiſed in the winter ſeaſon, it muſt be ſown upon a gentle hot-bed, and covered ſo as to defend it from great rains or froſt, both of which are equally deſtructive to it in that ſeaſon. If it be not raiſed till the ſpring, it may then be ſown in warm borders, well fenced from all nipping winds: but if it is to be continued in the ſummer, it muſt be ſown upon ſhady borders; and this ſowing ſhould be repeated every third day, or it will ſoon be too large for uſe, as it grows very faſt at that time of the year *.

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† *Viz.* Of the *Sclarea foliis cordato ſagittatis ſerratis acutis.* Clary with heart-ſhaped crenated leaves, which are acutely ſawed.——Our common garden Clary, originally a native of Syria, is the *Sclarea foliis rugoſis oblongo cordatis ſerratis, floribus colyce longioribus concavis acuminatis,* Clary with rough, oblong, heart-ſhaped, ſawed leaves, thoſe among the flowers concave, pointed, and longer than the empalement. MILLAR's *Gardener's Dict.* Art. SCLAREA.

A curled ſort of this plant is propagated in ſome gardens, more for curioſity, and to garniſh diſhes, than for any real uſe; for the common ſort is full as good. This curled creſs ſhould not be ſown quite ſo thick as the other, and when it's plants are come up, they ſhould be thinned, ſo as to leave the remaining ones at leaſt half an inch aſunder, that they may have room to expand their leaves. To preſerve this curled variety unmixed, all ſuch plants of it as ſeem to have a tendency to degenerate muſt be pulled up as ſoon as they are noticed.

The beſt method of ſowing both theſe ſorts of creſſes is in drills, becauſe it will then be eaſieſt to cut them as they may be wanted. Their ſeeds, which are very ſmall, ſhould be but barely covered with earth; and to ſave theſe ſeeds when they are ripe, the plants ſhould be drawn up, ſpread upon a cloth, and dried in the ſun for two or three days. They may then be eaſily beaten out; and they ſhould be kept in a dry place.

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* Mr. Mortimer ſays [b], that creſſes ſown about the middle of Auguſt, in natural ground, will reſiſt the froſt, and be fit for winter ſalleting.

[b] *Art of Huſbandry, Vol.* II. *p.* 154.

The *Indian Creſs* (commonly called *Naſturtium*, which is the right botanic name of the garden creſs, as *Tropæolum* is the proper appellation of this,) is an annual plant, ſeldom propagated otherwiſe than by it's ſeeds; though it may be continued through the winter, if kept in pots, and ſheltered in a good green houſe, and there it may be multiplied by cuttings, as is ſometimes practiſed with the double flowered ſort. But this is not worth while, as the ſeeds ripen every year, and plants are eaſily raiſed from them. They are often raiſed in hot-beds about the end of March or the beginning of April, and then tranſplanted: but they may be ſown in April, in the places where they are to remain. This, for the ſake of ornament, and that no ſmall one in a kitchen garden, ſhould be where their ſtalks may find ſupport, for they will climb up to the height of ſix or eight feet, and make a very pretty appearance when their flowers are blown. Thoſe of a deep orange colour, inclining to red, are leſs common now, in this country, than the larger ſort with a pale yellow flower; this laſt being generally preferred on account of it's ſize. Theſe flowers have a warm taſte like the garden creſs. They are commonly uſed for garniſhing of diſhes, and are frequently eaten in ſallets. Their ſeeds fall off as ſoon as they are ripe, and are excellent when pickled. Some call them Capuchin capers.

The *Water Creſs*, which grows naturally in ditches and rills of water in moſt parts of England, is much eſteemed as a ſallet herb in the ſpring of the year. Many people even prefer it to all other ſalleting of that ſeaſon, for it's agreeable warm bitter taſte, and becauſe it is reckoned an excellent anti-ſcorbutic, a great cleanſer of the blood, and a good diuretic. The Editor of the laſt edition of Mr. Mortimer's huſbandry ſays[u] that water creſſes, freſh gathered and eaten faſting in a morning, have performed wonders in conſumptive caſes; and he judiciouſly recommends to ſportſmen, or others, who ſtay long in the fields in cold weather, to gather them out of the ſprings where they grow, and eat them, as a better cordial to warm the ſtomach than any dram of ſpirituous liquors.

Water creſſes are eaſily cultivated by taking ſome of the plants, entire, from the place of their natural growth, early in the ſpring, with all their roots to them, then ſetting them in mud, and letting water in upon them by degrees, ſo as at length to form a kind of pond, if it cannot be continued as a running ſtream; though few ſpacious grounds are without ſome brook or other, along the ſides of which they will grow perfectly well. After they have taken root, they will ſoon multiply, eſpecially if they be not cut the firſt ſeaſon, but ſuffered to ripen their ſeeds; for theſe will fall into the water, and afterwards afford a ſufficient ſupply of plants. If the water is too deep to admit of planting them with eaſe, and if it be not a running ſtream, the beſt way is to throw upon it's ſurface, at the places where it is deſired they ſhould grow, ſome of the plants taken from elſewhere juſt as their ſeeds are coming to maturity: for they will there complete their ripening, ſink to the bottom, and produce a plentiful growth of creſſes.

Incautious perſons have, not unfrequently, ſuffered in their health, by eating the leaves of the creeping water parſnep, inſtead of thoſe of the water creſs. To guard againſt this miſtake, which may chance to prove fatal, it is proper to obſerve, that the leaves of the right water creſs are roundiſh, almoſt heart ſhaped, ſmall, with few indentures on their edges, and of a dark green colour; whereas thoſe of the water parſnep are oblong, pretty ſharp pointed, ſawed at their edges, and of a light green colour.

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[u] *Vol.* II. *p.* 153.

*Dandelion*, of which there are four or five ſpecies. grows naturally in the fields, where it is looked upon as a very troubleſome weed. If it's roots are planted in a ſpot of garden ground, and there blanched, by being earthed up, they will yield pretty long and tender ſhoots, which ſome people are fond of, as a ſallet, on account of their agreeable bitter taſte: but if they are ſuffered to perfect their ſeeds, which are light, downy, and of courſe eaſily blown about by the wind, they will ſoon ſpread to a much greater diſtance than may be deſired.

*Endive*, or Succory, is propagated by it's ſeeds only, which are longiſh, flat at one end, and roundiſh at the other, not unlike to little bits of ſmall ſtalks. Thoſe of the white, the green, and the curled, which are the ſorts cultivated in the kitchen garden, are of a whitiſh grey colour. The ſeeds of the wild ſuccory, which is uſed for medicinal purpoſes, are black, but of the ſame ſhape as the former. All the ſorts of endive are eſteemed aperitive and diuretic. They will grow in almoſt any ſoil, but thrive by far the beſt in deep, good, and well looſened mould. The management of each ſort is the ſame.

The curled endive is the ſort now moſt cultivated in England for ſallets in the autumn and winter, during which it may be continued in perfection, ſo long as the ſeaſon will permit, by obſerving the following directions.

The firſt ſowing of endive ſhould be about the middle of June; for that which is ſown earlier is apt to run up to ſeed, eſpecially if the ground be rich, and the ſituation warm, before the plants have arrived to a proper ſize for blanching. The ſecond ſowing ſhould be in the beginning of July, and the third and laſt about the middle of the ſame month. The plants of each of theſe ſowings will be ſo very different in their growth, that each bed will afford a ſucceſſion of two or three crops, and the three ſowings will of courſe furniſh an uninterrupted ſupply during the whole ſeaſon.

The plants muſt be well weeded, and frequently watered in dry weather, till they are fit to tranſplant. A ſpot of rich ground, proportioned to the number of plants intended to be ſet in it, ſhould then be prepared for them, by thorough digging, and laying of it's ſurface ſmooth; and, if it be very dry, it muſt be well watered. The largeſt plants ſhould be removed firſt from the ſeed bed, and the ſmaller ones ſhould be left there to gather ſtrength, which they will ſoon do after the additional room for their farther growth, ſo as, in their turns, to be fit alſo for tranſplanting. Care muſt be taken not to break their roots in drawing them up from the ſeed bed; and if the tops of their leaves are ſhortened then to nearly equal lengths, and they are ſpread with all their roots turned the ſame way, theſe little precautions will render the regular planting of them much eaſier, than when their heads and tails are jumbled promiſcuouſly together. They ſhould be tranſplanted in rows at leaſt one foot aſunder, and ſet ten inches apart in the rows. The earth ſhould be well cloſed around their roots, and they ſhould be well watered every other evening till they have taken good root, after which they muſt be kept clear from weeds.

If the plants left in the ſeed bed are alſo well weeded and watered, a ſecond tranſplantation may be made from thence in about ten days or a fortnight after the firſt, and the remainder of them will be fit to tranſplant, in the ſame manner as before, at about the ſame farther diſtance of time.

The plants that were firſt tranſplanted will be fit for blanching by the latter end of Auguſt at fartheſt. To do this properly, the gardener ſhould graſp in one hand all the inner leaves of the plant, in regular order, and then collect over them the outſide ſound ones; for the rotten and decayed leaves, which lie next to the ground, ſhould be pulled off and thrown away. The leaves thus gathered up ſhould be placed as nearly as can be in the natural order of their growth, ſo as not to croſs one another; and when the whole plant is thus collected, it ſhould be tied up very cloſe with a twig of oſier, or a ſtrong ſlip of baſs matt, at about two inches below the top. This ſhould be done in a very dry afternoon, when the middle of the plants is perfectly free from dew or rain: for any ſuch moiſture tied up in them, would ſoon make them rot. In about a week after this, theſe plants ſhould be tied again round the middle, to prevent their heart leaves from burſting out on one ſide, which they are otherwiſe apt to do, as they increaſe in bulk; and with this management they will be quite blanched in three weeks or a month, from the time of the firſt tying up. The largeſt plants ſhould always be tied up firſt; ſo that by going over the ſame ground once a week, and taking them according to their ſize, the crop will be continued longer than if they were all tied up at once: for they will not hold ſound and good above ten days or a fortnight after their blanching has been completed, eſpecially if the ſeaſon prove wet. For this reaſon it is moſt adviſeable to ſow and plant at different times, as before directed. But it is to be obſerved, that all the plants of the laſt ſowing ſhould be tranſplanted under pales, walls, or hedges, to ſcreen them from froſt; and if the winter be ſevere, they ſhould alſo be covered with peas-haulm, or ſome other light covering, which ſhould be carefully taken off in mild weather: and theſe borders muſt likewiſe be as dry as poſſible; for endive is very liable to rot, if planted in moiſt ground in the winter.

Only the plants of the two firſt ſowings are to be tied up in order to blanch them: for, after October, when the nights begin to be froſty, the plants of the late crop would be in great danger of being killed thereby, if they were to be left entirely above ground, even though they ſhould be covered with haulm. The beſt way of managing theſe, is to take them up in a very dry day, and with a large flat pointed dibble, plant them in the ſides of the ridges of earth laid very upright, facing the ſun, with only the tops of the plants out of the ground. The plants thus ſituated will be expoſed to as little wet as poſſible, for rain cannot then lodge upon them, and in about three weeks or a month's time they will be blanched fit for uſe: but they will not keep good long after that. Freſh ones ſhould therefore be planted in this manner every week or fortnight at fartheſt, by thoſe who would have a conſtant ſupply for the table; and if thoſe which were tranſplanted from the ſeed beds are kept till February or March, before they are thus ſet to blanch, ſallets of endive may be had regularly till the beginning of April, or later. This laſt planting will continue good longer than that which was made juſt before the beginning of winter; becauſe, as the days increaſe in length, the ſun grows warmer, and the too great moiſture of the earth, which would endanger the rotting of the plants, is more and more exhaled.

When the endive, blanched either way, is fit for uſe, it ſhould be dug up with a ſpade, and after all it's outſide green and decayed leaves have been ſtripped off, it ſhould be thoroughly waſhed in two or three different waters, to clear it from ſlugs and other vermin which commonly ſhelter themſelves among it's leaves.

If any of the plants ſhould put out flower ſtems either before or during the time of their blanching, they ſhould be immediately pulled up and thrown away.

In order to have good ſeeds of endive for the next ſeaſon, ſome of the largeſt, ſoundeſt, and moſt curled plants (a dozen of ſuch will yield ſeeds enough for any middling family) ſhould be choſen from among the borders where the laſt crop was tranſplanted, before the reſt of it is put into the ridges to blanch. Theſe ſelected plants ſhould be carefully taken up, in the beginning of March, if the weather is mild, (otherwiſe it may be deferred a fortnight longer), and tranſplanted into a well ſheltered place, at the diſtance of about eighteen inches aſunder, in one row, which ſhould be placed pretty near to the fence, whether it be wall, pale, or hedge; but not too near, eſpecially if it be the former, becauſe the danger of froſts and nipping winds is greateſt quite cloſe to a wall[x]. Theſe plants ſhould be kept very clear from weeds, a deep ſtirring or two of the earth will give them great vigour, and when their ſtems begin to advance in height, they ſhould be ſupported by a ſtring run along before them, and faſtened at each end, either to the fence, or to ſtakes ſet up for this purpoſe. About the beginning of

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[x] See *p.* 20.

July, theſe ſeeds will begin to ripen. As ſoon as they are quite ripe, the ſtalks muſt be cut off, and ſpread upon a coarſe cloth, to dry in the ſun. They ſhould then be beaten out, dried again in the ſun, and laid up in bags, or paper, in a dry place. But a circumſtance of ſome moment here is, that it would be wrong to wait for the ripening of all the ſeeds of the ſame plant, becauſe, ſuch is their irregularity in this reſpect, the firſt ripe and beſt of the ſeeds will ſcatter and be loſt, before the others are near ripe.

*Eſcallion.* See *Scallion.*

*Lettuces* of all kinds are multiplied only by their ſeeds, which they produce the firſt year, and then die, if they have not been tranſplanted. The ſorts generally cultivated in the kitchen garden are, the common, or garden lettuce, the cabbage lettuce, Cilicia lettuce, the brown Dutch lettuce, the Aleppo lettuce, the Imperial lettuce, the green Capuchin lettuce, the Verſailles, or upright white Cos lettuce, the black Cos, the red Cos, the red Capuchin lettuce, the Roman lettuce, the Prince lettuce, the Royal lettuce, and the Egyptian Cos lettuce.

The firſt of theſe is moſt commonly ſown for very early uſe, to mix with other ſmall ſallet herbs. It is only a degeneracy of the cabbage lettuce, or this laſt is an improvement of it by repeated good culture: for the ſeeds of cabbage lettuces which have not cabbaged cloſely will produce the former ſort, which gardeners diſtinguiſh particularly by the name of lapped lettuce. Theſe may be ſown at any time of the year, only obſerving, to chooſe ſhady borders in hot weather, warm ſituations in the ſpring and autumn, and to ſow under glaſſes in the winter, becauſe ſevere froſts would kill the young plants.

The cabbage lettuce is likewiſe ſown at ſeveral different times, in order to have a ſupply of it throughout the ſeaſon. The firſt crop of this is generally ſown in February, upon an open warm ſpot of ground. When the plants are come up, they ſhould be thinned to the diſtance of about ten inches aſunder every way, either by hoeing them, if their ſuperfluous numbers be not wanted, or by drawing them up by hand where they ſtand too cloſe, and tranſplanting thoſe which are thus removed into other good mould, likewiſe at the diſtance of about ten inches from each other. If this is done before the plants are too large, they will thrive well; though the tranſplanted ones will ſeldom grow ſo big as thoſe which were not removed: but, in return, they will come ſomewhat later, and thereby anſwer the purpoſe of thoſe who do not repeat this ſowing every fortnight.

In proportion to the advance of the ſeaſon, the ſubſequent crops ſhould be ſown in a more ſhady and moiſt ſituation, but by no means under the drip of trees, leſt the plants ſhould run up to ſeed before they cabbage, eſpecially in the heat of ſummer. The laſt crop of theſe lettuces, which are to ſtand all the winter, ſhould be ſown by the middle of Auguſt, pretty thin, upon a good light ſoil, warmly ſituated; and when the plants are come up, they muſt be well weeded, and thinned, by hoeing, ſo that they may not touch each other. The beginning of October will be a proper time for tranſplanting them into warm borders, where they will reſiſt the winter, if it be not very ſevere: but, to guard againſt it's inclemency, and thereby be ſure of a crop, it will be adviſable to tranſplant ſome of this growth into a bed which may be arched over with hoops, and covered with mats, ſtraw, or peas haulm, in hard weather. They may be ſet pretty cloſe together; and if they are retranſplanted in the ſpring, into a warm and rich ſoil, at the diſtance before mentioned, they will do very well; though they will not cabbage ſo ſoon as thoſe which may have been left un-removed under a warm wall, if theſe laſt eſcape the winter, and if the neceſſary caution has been obſerved, of not placing them too cloſe to the wall; for this ſituation would make them run up in height, and conſequently prevent their growing large or hard.

To have good ſeeds of this ſort of lettuce, the plants ſhould be looked over when they are in perfection, and the largeſt, hardeſt, and loweſt growing of them ſhould be marked out by ſticks thruſt into the ground cloſe to them. All the reſt ſhould be carefully rooted out as ſoon as they begin to run up, leaſt the farina of the flowers of theſe inferior ones ſhould intermix with the others, and thereby occaſion a degeneracy of their ſeeds.

The beginning of February is alſo the firſt ſeaſon for ſowing the Cilicia, the Imperial, the ſeveral kinds of Cos, and the other ſorts of lettuces above mentioned: but this early ſowing ſhould be upon a gentle hot-bed covered with a frame. The ſecond ſeaſon, for theſe, is the latter end of February, or beginning of March, upon a border of light earth, and in a warm expoſure, and open ſituation, that is to ſay, in a ſituation not ſhadowed by trees. When the plants come up on the hot-bed, plenty of freſh air ſhould be admitted to them, to prevent their being drawn up weak; and when they have got five or ſix leaves, they ſhould be tranſplanted into another hot-bed, to bring them forward: but this laſt need only be arched over with hoops, and covered with mats; for they ſhould not be kept too warm there. When they are removed from thence, and planted out for good, which ſhould be as ſoon as they are ſtrong enough to bear it, they ſhould be ſet ſixteen inches aſunder every way, in a well looſened ſpot of fine good earth. Thoſe which were ſown in the warm borders ſhould alſo be tranſplanted into a ſimilar ſpot, and ſet at the ſame diſtances as the former. If the ſeaſon is dry, care ſhould be taken to water both the one and the other till they have taken root, and then to keep them conſtantly clear from weeds. This is the only culture that any of them will require, except the black Cos lettuces, which ſhould be tied up when they are full grown (in the manner before directed for blanching of endive) to whiten their inner leaves, and render them criſp; for they ſeldom cabbage well without this aſſiſtance.

To continue theſe lettuces through the ſeaſon, other crops of them muſt be ſown in April, May, and June; obſerving, for the reaſons before given, to ſow the lateſt in the moſt ſhady ſituation. Towards the middle or latter end of September, ſhould be the laſt ſowing, and the plants produced thereby ſhould be tranſplanted, either under glaſſes, or into a bed arched over with hoops and covered in the winter, to prevent their being deſtroyed by the froſt: but as much free air as poſſible ſhould be admitted to them when the weather is mild, and they ſhould be covered only in hard rains, or when it freezes; for if they are too cloſely covered they will grow mouldy, and ſoon after rot.——In the ſpring, they ſhould be removed into a rich light ſoil, and there ſet at leaſt eighteen inches aſunder every way: for if they are planted too cloſe, they will be apt to run up in height, and not to cabbage well.

This is the crop from which it will generally be moſt proper to ſave the ſeeds of theſe lettuces, if they ſucceed well: though it will be right alſo to mark out ſome of the fineſt plants of the crop ſown in the ſpring; becauſe thoſe of the laſt ſowing may ſometimes fail, through the wetneſs of the ſeaſon, even when they are in full bloom, and the others may do well by having more favourable weather: but if both ſhould ſucceed, there will be no room for complaint, ſince the ſeeds of lettuces will grow perfectly well after they are two years old, and, if they have been ſaved with due care, even at the end of three years. Very great caution ſhould be uſed here, not to let any of the common ſorts ſeed among or near theſe more valuable plants; not only for the reaſons before aſſigned, but becauſe they are naturally the moſt apt to degenerate in this country. The beſt way therefore is to keep the plants of each ſort which are intended for ſeed, as ſeparate as poſſible from all others, and to ſuffer none of them to perfect their ſeeds, except ſuch as are entirely approved of.

The Egyptian green Cos, the white Cos, the Cilicia, and the red Cos, are the moſt valuable of all the ſorts of lettuce cultivated in England. The royal and imperial lettuces are very good; but not ſo generally eſteemed. The white coſs uſed to be preferred to all others, till of late years, that the Egyptian green coſs, and the red coſs, have been found to be by far the ſweeteſt and tendereſt. Theſe will endure the common cold of our winters full as well as the white coſs: but they are more apt to rot, if the ſeaſon of their cabbaging be very rainy.

The green Capuchin and the brown Dutch lettuces are very hardy ſorts, and may be ſown at the ſame ſeaſons as the common cabbage lettuce. They are very proper to plant under a hedge, or other fence, to ſtand the winter; becauſe they will often live there, when moſt of the other ſorts are deſtroyed. They will alſo bear more heat and drought, and therefore are very fit for late ſowing: nor do they run up to ſeed ſo ſoon as the other ſorts, after they are cabbaged. If ſome of them are planted upon a gentle hot-bed in autumn, and well covered with a frame, they will cabbage ſo as to be fit for uſe in February and March, and may be continued till thoſe in the open air are ready for the table. All theſe qualities render them valuable: eſpecially as, in conſequence thereof, theſe may be had at a time when there are but few others. To prevent their degenerating, none but the largeſt and beſt cabbaged of theſe plants ſhould be ſet apart for ſeed; and all the cautions before given in this reſpect ſhould be ſtrictly obſerved here.

Beſides the general rule before mentioned, of not ſuffering two different ſorts of lettuces ever to ſtand near each other when they bloſſom, leſt the mixing of their farina ſhould make both of them vary from their original, and partake of each other; it is neceſſary, eſpecially for thoſe which run up high, ſuch, in particular, as the Cilicia, the Cos, and the other large growing ſorts, to thruſt down by the ſide of each, a ſtake to which it's ſtem ſhould be tied, to prevent it's being broken, or blown out of the ground by wind. The ſeed branches ſhould be cut as faſt as the ſeeds ripen, without waiting to have the ſeed of the whole plant together; for there will frequently be a fortnight or three weeks difference between the ripening of one part and that of another; and when they are cut, they muſt be ſpread upon a coarſe cloth, in a ſunny place, to dry the ſeeds yet more. The ſeeds ſhould then be beaten or rubbed out, dried again in the ſun, and afterwards laid up in a dry place, where neither mice nor other vermin can get at them; for if they do, they will ſoon eat them up.

*Muſtard* is an annual plant, raiſed from it's ſeed only. The white muſtard, as it is commonly called, is the ſort chiefly cultivated in gardens, for a ſallet herb in the winter and ſpring. The ſeeds of this are ſown very thick in drills, either upon a border warmly ſituated, or if the weather be very cold, upon a gentle hot-bed, in the ſame manner as creſſes and other ſmall ſalleting, and in about ten days or a fortnight after the time of ſowing, the plants will be fit for uſe; for when they are large and have rough leaves, they are too ſtrong to be mixed with ſallets.

The beſt way to ſave the ſeeds of this plant, is to ſow a ſpot of ground with it in the ſpring, to thin the plants when they have about four leaves, and at the ſame time to hoe down the weeds, as is practiſed for turneps. This hoeing is to be repeated in about a month after, and the plants are then to be left about eight or nine inches aſunder, which will be a ſufficient ſpace for the growth of this ſpecies. If theſe hoeings are well performed, in dry weather, they will keep the ground clean till the muſtard ſeeds are ripe. The ſtalks of this plant, which are branched and hairy, will then be about two feet high, and the ripening of it's ſeed is indicated by the pods changing to a brown colour; immediately after which they ſhould be cut down, dried upon cloths, for two or three days, and then threſhed out for uſe.

The larger ſorts of muſtard, the ſeeds of which are uſed chiefly for ſauce, are to be treated in the ſame manner; excepting that, as they grow much larger, a proportionably greater ſpace muſt be left between their plants; and as their ſeeds will not ripen ſo ſoon as thoſe of the ſmaller kind, three hoeings, or rather good deep ſtirrings, of the ground may be requiſite for them. One of theſe larger ſorts, which is the common muſtard, grows naturally in very many parts of England, but is cultivated in the fields for it's ſeeds, of which the ſauce called muſtard is made; and another ſort, which likewiſe grows naturally in our arable lands, and alſo is cultivated for uſe, produces the ſeeds which are commonly ſold under the appellation of Durham muſtard ſeed. The ſtalks of this laſt ſort ſeldom riſe above two feet high: but thoſe of the former generally run up to the height of four or five feet.

*Naſturtium.* See *Creſſes (Indian).*

*Rape* ſeeds are frequently ſown in drills in the kitchen garden, in the ſame manner as creſſes and muſtard, like which they ſprout in a few days, and the plants produced from them, being alſo of the warm kind, are mixed with winter and ſpring ſallets, when they are very young. The farther culture of this genus of plants does not belong to the preſent ſubject, and has already been treated of [y].

*Scallions,* or *Eſcallions,* are a ſort of onion whoſe root never becomes a bulb. They are uſed chiefly in the ſpring in lieu of green onions, and were formerly much more common than at preſent; for they are now ſo ſcarce as hardly to be met with. The gardeners near London have a trick of ſubſtituting in their ſtead onions which, after they have decayed and ſprouted in the houſe, they plant early in the ſpring in a bed where they ſoon grow large enough for their purpoſe, which is, then to pull off all the outer coat of the root, to tie them up in bunches, and to ſell them in the market for ſcallions: but, which cannot be done with theſe, the root of the true ſcallion is eaſily parted, and it is by ſetting of their ſlips, either in the ſpring or autumn, that this plant is propagated. The autumn is the beſt time, becauſe the ſcallions tranſplanted then will be fitteſt for uſe the next ſpring. Theſe offsets ſhould be planted three or four in a hole, in beds or borders about three feet wide, and the holes ſhould be about ſix inches aſunder every way. The plants thus ſet need only be kept clear from weeds, and they will multiply exceedingly in almoſt any ſoil and ſituation.

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[y] See *Vol.* III. *p.* 197.

*Sorrel* is uſed for many purpoſes in the kitchen, and they who are fond of acid herbs in their ſallets cannot well have one whoſe tartneſs is more agreeable. The two ſorts chiefly cultivated in the kitchen gardens here are, the common ſorrel, which has longiſh and ſharp pointed leaves, and the round-leafed garden, or Roman ſorrel. Both of theſe are perennial; but the round-leaved ſort is moſt eſteemed.

This is propagated by it's creeping roots, which may be tranſplanted either in ſpring or autumn; but the autumn is beſt for dry ground. The diſtance between them ſhould be at leaſt two feet every way; for this plant ſpreads pretty far, and increaſes greatly, eſpecially on ſtony land; for it's natural growth is upon rocks. It ſeldom produces good ſeeds; and hardly any at all when it is ſet in a light ſoil.

The common ſorrel, which grows naturally in paſture lands in moſt parts of England, and which is conſiderably improved by culture in the garden, is multiplied either by it's ſeeds, or by parting of it's roots. The former of theſe methods produces the largeſt and moſt ſucculent plants, if they are allowed ſufficient room: but in whichever way they are raiſed, they ſhould ſtand at leaſt ſix inches aſunder, in rows ſo far diſtant from each other as to admit of digging the ground between them every ſpring, if not oftener, eſpecially in the hot months, beſides hoeing up the weeds whenever theſe are numerous, or begin to grow tall. Autumn is the beſt time for ſowing of theſe ſeeds upon dry land, and alſo for parting or tranſplanting the roots, which, with the above management, may ſtand un-removed for two or three years.

The ſeeds of the annual ſorts of ſorrel ſhould be ſown about the latter end of March, on a bed of common earth, in rows a foot and an half aſunder; and when the plants are come up, they ſhould be thinned to the diſtance of four or five inches from each other. This, and keeping them clean from weeds, is all the culture that they will require: but both their ſize and their goodneſs will certainly be increaſed by a good ſtirring or two of the ground, which may eaſily be given at the time of weeding; for both ſhould be done in dry weather. Theſe plants will flower in July, and their ſeeds will ripen in autumn.

*Succory*. See *Endive*.

*Tarragon* is propagated by ſeeds, ſlips, or cuttings. March or April is the proper time for ſetting them, and they may be tranſplanted again in the ſummer. The plants ſhould ſtand at leaſt a foot aſunder every way, and they ſhould be kept clean from weeds. They will endure great cold; and even extraordinary drought will not hurt them, if they are but a little watered, or if the earth about them is kept looſe and well ſtirred. A very few of their leaves mixed with a ſallet, particularly of lettuces, give it a high aromatic flavour. The tendereſt and freſheſt are the beſt for this purpoſe.

A former poſſeſſor of the copy of Mr. Worlidge's Huſbandry now in my hands, has written upon a blank leaf at the beginning of it, the following directions for raiſing a ſallet of ſmall herbs very expeditiouſly, in a chamber, or elſewhere within doors. I mention it only as a matter of amuſement.

"Take a pan as big as your hat, fill it will water, ſpread over it a cabbage net which ſhall juſt touch the ſurface of the water, and lay upon this wool which ſhall alſo juſt touch the water: when this wool is wet through, ſow upon it ſeeds of muſtard, creſſes, radiſhes, lettuce, &c. and in a fortnight their plants will be fit to cut for a ſallet."

The ſame may be done, rather more conveniently, by ſtrewing theſe ſeed between two pieces of flannel wet and ſpread in a diſh, which may be ſet in a window. The young plants will ſoon pierce through the upper flannel, if only a little water be kept conſtantly in the bottom of the diſh, to continue the moiſture neceſſary for their vegetation.

## ARTICLE V.

### *Of ſweet Herbs.*

*BALM* is either raiſed from ſeeds, or propagated by ſlips from it's root, which is perennial, though it's ſtalks are annual. The ſpring is the beſt time for ſowing theſe ſeeds, and October is the moſt proper time for ſetting the offsets, that they may have time to get ſtrength before the froſts come on. The roots of this plant may be parted into ſmall pieces, with three or four buds to each, and theſe ſlips ſhould be ſet two feet aſunder in beds of common garden earth, where they will ſoon ſpread ſo as to meet each other. The only culture which they require is, to water them till they have taken root, to keep them clear from weeds, to cut off their decayed ſtalks in the autumn, and to ſtir the ground between the plants where it is not covered by their leaves.

The virtues of this herb are well known.

*Baſil* is of ſeveral ſorts: that which bears the largeſt leaves, eſpecially if they are of a purpliſh colour, is reckoned the beſt; but that which has the ſmalleſt leaves is accounted the moſt curious; and that with middling ſized leaves is the moſt common. All theſe are annuals, and very tender plants; for which reaſon it ſeldom is attempted to raiſe them otherwiſe than by ſowing their ſeeds in a hot-bed. Theſe ſeeds are very ſmall, ſomewhat oval and of a dark cinnamon colour. March is the moſt proper time for ſowing them: the hot-bed ſhould be gentle; and when the plants are come up, they ſhould be tranſplanted into another yet more moderate hot-bed, where they muſt be ſhaded and watered till they have taken freſh root: or, if they are ſufficiently thinned, the remainder of them may be left where the firſt grew. In either caſe, they ſhould be gradually accuſtomed to the air, and have plenty of it in mild weather; they ſhould be watered frequently, for they love moiſture; and they ſhould be taken up in May, with a ball of earth about their roots, and tranſplanted into pots or borders, where they muſt be ſhaded and watered again, till they have taken root. They will require no farther care, except weeding them, and refreſhing them with water in dry weather till they have perfected their ſeeds, which will be in September. The ſeeds of thoſe ſorts which appear moſt diſtinct, may then be ſaved ſeparately, for ſowing in the next ſpring: but as they ſeldom ripen perfectly in the open air in this country, we generally uſe thoſe which the ſeedsmen import from the ſouth of France, or from Italy.

If any particular ſort ſhould ariſe from the ſeeds, and the poſſeſſor thereof ſhould be deſirous to increaſe it, cuttings may be taken off at any time in May, and planted in a moderate hot-bed, where they will take root in about ten days, if they are well ſhaded and watered, and in about three weeks they will be fit to remove into pots or borders.

As the odour of theſe plants is too ſtrong for moſt people, eſpecially if they are in the ſame room, or otherwiſe near them, they ſhould always be ſet at ſome diſtance from the habitation; leſt their perfume, if there be any quantity of them, ſhould extend to the apartments, when the windows are open.

*Borage*, is an annual plant, which, if ſuffered to ſow itſelf, will come up plentifully, and grow without any care. It's ſeeds are ſmall, oval, and black, with generally a ſpeck of white at their lower end. If theſe are ſown on an open ſpot of ground, and if the plants are kept clear from weeds, by one or two hoeings, and thinned to the diſtance of ſix or eight inches from each other, they will require no farther trouble. The plants raiſed in the autumn will flower in May, but thoſe raiſed in the ſpring will not bloſſom till June; ſo that, where a continuation of theſe flowers is deſired, there ſhould be a ſecond ſowing in the ſpring, about a month after the firſt: but this ſhould be in a ſhady place, though not under the drip of trees; and if the ſeaſon is dry, the ground muſt be watered frequently, to bring up the plants. Theſe will continue flowering till the end of ſummer.

*Burnet* of a ſmaller kind than either of the ſorts mentioned in the preceding volume of this work [y], has frequently a place in the kitchen garden, either for the ſake of it's young leaves, which are mixed ſparingly with ſallets, or for thoſe leaves when older, to put into cool tankards. As a phyſical herb, it is accounted cordial and alexipharmic, and the powder of it's root is thought to be of ſervice againſt ſpitting of blood.

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[y] See *Vol.* III. *p.* 283—291.

This plant may be propagated by parting of it's roots and ſetting of theſe offsets in the autumn; but it is moſt eaſily raiſed from ſeeds ſown in that ſeaſon, much rather than in the ſpring, becauſe theſe laſt often lie in the ground till the next year. If the young plants are tranſplanted to the diſtance of a foot aſunder, in a bed of common earth, and watered till they have taken root, they will not require any farther care, but keeping them clear from weeds. They will laſt ſeveral years; for the roots of this ſpecies are perennial: or they will ſow themſelves, and thereby produce a plentiful crop of new plants. The ſoil for burnet ſhould be dry.

*Calamint* is uſed chiefly for medicinal purpoſes. It is hotter than mint, and abounds more with ſubtile and volatile parts. If planted in the garden, it may be raiſed from ſlips, offsets of the roots, or ſeeds. It's culture is the ſame as that of the balm.

*Carduus*, though not one of the ſweet herbs, merits a place in ſome remote part of the kitchen garden, on account of it's medicinal uſe to a country family, which may not, perhaps, always be able to get it immediately from an apothecary's ſhop. I therefore beg leave to mention it here, as I juſt now perceive my having omitted it before.

The *Carduus Benedictus*, or bleſſed thiſtle, which is the ſpecies here meant, is moſt commonly propagated by ſowing it's ſeeds in the autumn, on a bed of common earth, in a dry place. The plants, which will ſoon come up, ſhould be tranſplanted in the ſpring, ſo as to ſtand a foot aſunder every way. If the ſeaſon is dry, they muſt be watered two or three times, till they have taken root, after which they will require no farther care, but to keep them clear from weeds.

The plants raiſed from theſe ſeeds ſown in the ſpring, do not thrive ſo well, nor grow ſo large as thoſe of the autumnal ſowing.

This plant ſhould be cut for uſe when it's flowers are full blown, which is in June, before it's lower leaves decay: when cut, it ſhould be ſpread in a dry ſhady place for three or four days, then tied up in bunches, and afterwards hung up in a dry room, upon rows of ſtrings, where the air may paſs freely between them, to prevent their growing mouldy.

The ſeeds of thoſe which are left uncut will ripen in autumn, and the plants will then die. Theſe ſeeds are oblong, ſtreaked, of a brown colour, and encompaſſed with ſtiff briſtles at the top.

The whole of this plant is very bitter.

*Chamomile* grows wild upon commons and other waſte land in many parts of England, particularly in moiſt and ſhady places, which it moſt delights in. It is a trailing perennial plant, which puts forth roots from the joints of it's braches as they lie on the ground, and thereby ſpreads and multiplies exceedingly; ſo that whoever would cultivate it, need only procure a few ſlips of it in the ſpring, and plant them about a foot aſunder, that they may have room to ſpread; they will ſoon cover the ground.

Chamomile walks were formerly a ſort of faſhion in gardens; and indeed they looked pretty enough for ſome time after they were mowed and rolled: but they are now quite diſuſed, becauſe this plant is very apt to decay in large patches, which then become diſagreeable to the eye.

The chamomile flowers which are uſed medicinally ſhould be of the ſingle kind, becauſe they are ſtrongeſt: but the market people generally ſell the double becauſe they are the largeſt.

The double flowered ſort is as hardy as the ſingle, and may be propagated in the ſame manner.

*Coaſtmary* is a name ſometimes given to *Tanſey*; which ſee.

*Dill* muſt be ſown where it is to remain, for it will not bear tranſplanting. The ſoil for this plant ſhould be light, and it's ſeeds ſhould be ſown in the autumn, ſoon after they are ripe; for they ſeldom grow well if they are kept out of the ground till ſpring. When the plants are come up, they ſhould be thinned to the diſtance of eight or ten inches from each other, that they may have room to put out their lateral branches, and if they are afterwards kept clear from weeds, by good hoeing, they will not require any farther care. When their ſeeds begin to be formed, ſuch of them as are intended to be put into pickle for cucumbers (for that is their chief culinary uſe) ſhould be cut; and when the ſeeds of the remainder, deſtined for ſowing, are ripe, they ſhould be dried upon a cloth, and then beaten out. If they are ſuffered to ſow themſelves, they will produce in the ſpring a multitude of young plants, which will want no other culture, than thinning them with a hoe, and keeping them free from weeds.

*Fennel*, like dill, to which it is near a-kin, is beſt raiſed from ſeeds ſown ſoon after they are ripe. Theſe ſeeds are ſmall, longiſh, oval, and of a yellowiſh colour, ſtriped with greeniſh grey ſtreaks. They will grow in any ſoil or ſituation; and the plants produced by them (which will come up in the ſpring) require no other care than thinning them where they are too cloſe, and keeping them clear from weeds. They will flower in July, and perfect their ſeeds in autumn.

The roots of the common fennel are ſtronger, more fleſhy, penetrate deeper into the ground, and laſt ſome years longer, than thoſe of the ſort diſtinguiſhed by the appellation of ſweet fennel: but, this excepted, there is little difference between them, unleſs it be, that the leaves of the ſweet fennel are the longeſt, ſlendereſt, and leaſt numerous, that it's ſtalks do not riſe ſo high as thoſe of the common kind, and that it's ſeeds are longer, narrower, and of a lighter colour. Both of theſe ſorts are very hardy, and require equally little trouble in their culture. They ſpring again when cut, and their youngeſt and tendereſt ſhoots are the beſt for uſe.

*Finocchio* is a ſpecies of fennel too tender to ripen it's ſeeds perfectly in this country. We therefore import them from Italy, where it is cultivated as a ſallet herb; for it is too ſtrong for an Engliſh ſtomach, though ſome few curious gentlemen do now and then raiſe it here. It's ſtalks are very ſhort; but fleſhy, tender, and near two inches thick, to the height of four or five inches above the ground; and this is the part which is eaten, when blanched, with oil, vinegar and pepper. Even at their utmoſt growth, when run up to ſeed, the ſtalks of this plant ſeldom riſe higher than about eighteen inches. It's ſeeds are narrower, more crooked, and of a brighter yellow, than either of our before-mentioned ſorts of fennel. They have alſo a very ſtrong ſmell like aniſeed, and are very ſweet to the taſte.

Theſe ſeeds, which muſt be perfect in their kind, or they will not be worth the trouble of cultivation, ſhould be ſown in ſhallow rills made in a well dug ſpot of light and rich earth, neither very dry, nor over moiſt; for this plant will not thrive in either extreme. The drills ſhould be drawn by a line, and the diſtance from each other ſhould be at leaſt two feet, that there may be room to clean and ſtir the ground between them, and alſo to earth up the plants when they are full grown. The ſeeds ſhould be ſcattered thin in theſe rills; for the plants in them ſhould ſtand pretty far apart, leſt they ſhould impoveriſh one another: but as an allowance muſt be made for the miſcarriage of ſome, they may be ſown about two inches aſunder. Half an inch deep of earth will cover them ſufficiently.

The firſt crop, which may be ſown about the middle of March, will, if it ſucceeds, be fit for uſe in July; and by continuing to ſow at the diſtance of about every three weeks, till the latter end of July, a ſucceſſion of this plant may be had till the hard froſts ſet in. The crops ſown in April, May, and June, ſhould have a proportionably moiſter ſoil than that which was choſen for the firſt; and thoſe which are ſown late in July ſhould have a drier ſoil and warmer ſituation, becauſe, as the plants of this ſowing will not be fit for uſe till the autumn is pretty far advanced, they would be liable to an increaſe of accidents, from too much wet, or cold, if they were ſown in a moiſt ſoil. But it is to be obſerved, that as the ground is often extremely dry in June and July, and the ſeeds are, for that reaſon, moſt apt to miſcarry then, it will be right to water and ſhade the beds in which they are ſown at that time, and if the weather ſhould continue to be very dry, the plants themſelves muſt be watered pretty frequently, or they will run up to ſeed, without growing to any tolerable ſize. When this is practiſed, the directions of gardeners are, to make a channel at each row of the plants, to detain the water which is poured on them: but numbers of experiments in the new huſbandry prove, that the earth is conſtantly preſerved in a ſtate of ſufficient moiſture, even in the drieſt ſeaſons, by ſtirring it well, deep, and frequently; without any danger of rotting the plants, or chilling their roots, as muſt be the caſe when water is ſuffered to remain long near or upon them.

When the plants are come up, which will be in three weeks or a month after ſowing, all the weeds between them muſt be carefully hoed out, and they muſt be thinned to the diſtance of about four inches from each other. As they advance in growth, and new weeds ſpring up, the hoeing muſt be repeated from time to time, and they ſhould at laſt be thinned ſo as to ſtand at leaſt eight inches aſunder in the row. If the plants are of a good kind, their ſtems will ſwell to a conſiderable bulk juſt above the ſurface of the ground; and this part ſhould be earthed up, in the ſame manner as is practiſed for celeri, to blanch it, about a fortnight before it is to be uſed. This will render it criſp and tender.

The late ſown plants, beſides being likewiſe earthed up, to blanch them, whenever they are fit for it, ſhould be covered with ſtraw, peas haulm, or ſome other light covering, in the autumn, if any ſharp froſt ſhould happen then; and by this means they may be continued fit for uſe till the middle of winter.

*Hyſſop* is propagated either by ſeeds, ſlips, or cuttings, and thrives beſt in poor dry ground; for it will bear the cold of our climate better there, than when it is planted in a richer ſoil, in which laſt it will grow very luxuriant in ſummer, and conſequently be the more tender when the warm weather is paſt. Such of theſe plants as chance to grow out of the joints of old walls, for example, as they frequently do, will reſiſt the ſevereſt froſt, and be much more aromatic, than thoſe which are raiſed in the fineſt dunged land.

If hyſſop is raiſed from it's ſeeds, they ſhould be ſown in March, in a light ſandy ſoil, and when the plants are come up, they ſhould be tranſplanted ed into the poor ground where they are to remain, at the diſtance of at leaſt two feet aſunder every way; for they grow pretty large if they are not frequently cut. The ſlips or cuttings of this plant ſhould be ſet in April or May, and they muſt be defended from the heat of the ſun, and be frequently watered, till they have taken root, which will be in about two months. They muſt then be tranſplanted into the places where they are to remain, and their management after this is the ſame as before directed for the ſeedlings. All theſe plants flower in July and Auguſt, and ripen their ſeeds in September; but their roots will laſt many years. The only ſort of hyſſop cultivated for uſe in this country (for the other ſorts raiſed here are merely for curioſity) does not riſe higher than a foot and an half; it's flowers are blue, in ſpikes; and it's ſeeds are ſmall, oblong, and black.

*Lavender*, whether of the broad leaved ſpecies, generally called Spike, or Lavender Spike, or of the common narrow leaved ſort, is chiefly propagated by cuttings or ſlips of a year's growth. Theſe ſhould be planted in March, in a ſhady ſituation, or at leaſt they ſhould be ſhaded with mats till they have taken root. They may then be expoſed to the ſun; and after they have got ſufficient ſtrength, they ſhould be removed to the places where they are to remain. The broad leaved lavender does not often produce flowers; but when it does, they appear towards the latter end of July, at which time the ſpikes of the common ſort, which bloſſom the earlieſt of the two, and which is the kind cultivated for medicinal uſes, are fit to be gathered. Both theſe ſorts will grow quickeſt, in the ſummer, if they are planted in a rich and moiſt ſoil; but then they ſeldom eſcape the inclemency of the winter: nor will they have half ſo ſtrong an aromatic ſcent, or laſt near ſo long, as thoſe which are ſituated on a dry, gravelly, or ſtony ſoil. In ſuch land as this, or even upon a barren rocky ſpot, where their ſpicy odour will become ſtill more exhaled, they will reſiſt all the ſeverity of our hardeſt winters.

*Lavender-cotton* is propagated in the ſame manner as the former ſorts of lavender; but it is a much more tender, and far leſs fragant plant. It's leaves and ſometimes it's flowers, are uſed in medicine, and are reputed good to deſtroy worms.

*Marigolds* are raiſed from ſeeds ſown in March or April, in the place where the plants are to remain. They require no other culture than keeping them clean from weeds, and thinning them to the diſtance of about ten inches aſunder, that their branches may have room to ſpread. They will begin to bloſſom in June, and continue in flower till the froſt kills them. Their ſeeds will ripen in Auguſt and September, and, if they are ſuffered to ſow themſelves, will produce a plentiful crop of young plants in the next ſpring: but as theſe will conſiſt of a mixture of good and bad ſorts, it is moſt adviſable to prevent this ſpontaneous growth, to ſave the ſeeds of the beſt flowers only, and to ſow each variety, whether ſingle or double, by itſelf.

*Marjoram.* The common ſort of this plant, generally diſtinguiſhed by the name of *ſweet marjoram*, is eſteemed an annual, though it's roots live through the winter in mild ſeaſons. Mr. Miller therefore thinks it only biennial[z]. It is propagated by ſeeds, which, as they ſeldom ripen in this country, are uſually imported from the ſouth of France, or from Italy. They ſhould be ſown about the latter end of March, in a border warmly ſituated, and when the plants are about an inch high, they ſhould be taken up carefully, with as much earth as can be about their roots, and ſet ſix inches aſunder every way in a bed of fine rich mould. They muſt be watered there till they have taken freſh root, and after that they will require no farther trouble, except keeping them clear from weeds. They will ſoon ſpread ſo as to cover the ground, and their heads will begin to flower in July, which is the time to cut them for uſe. They are then called knotted marjoram.

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[z] *Gardener's Dict.* Art. ORIGANUM.

The ſort now commonly known by the name of *winter ſweet marjoram*, was formerly termed pot marjoram. This is propagated by parting of it's roots in autumn, when they ſhould be ſet in a pretty dry ſoil, at ſufficient diſtances to give them room to ſpread. Theſe offsets muſt be watered till they have ſtruck out new roots, and the trouble of their culture is then over, except weeding them whenever it may be neceſſary. This plant is cultivated chiefly for noſegays, becauſe it bloſſoms ſooner than the common ſweet marjoram: but it is alſo uſed for the ſame culinary purpoſes, until the other becomes fit to gather.

The ſpecies now diſtinguiſhed by the name of *pot marjoram*, becauſe it is the ſort generally uſed in the kitchen, is, in fact, the common wild origany, or marjoram, improved by culture in the garden. This is the moſt hardy kind of marjoram, and may be very eaſily propagated, either by ſowing it's ſeeds in the ſpring or in autumn, but the autumn is beſt; or by parting it's roots, and then ſetting them anew, eſpecially in the laſt mentioned ſeaſon. Any ſoil that is not over moiſt will do for this plant, and it will alſo thrive in any ſituation, if it be but kept clear from weeds. It flowers in June and July, and it's ſeeds ripen in the autumn. If theſe are permitted to ſcatter, they will ſow themſelves, and a vaſt number of plants will ariſe from them in the enſuing ſpring.

*Mint* of all kinds (for there are ſeveral ſpecies of it) is very eaſily propagated by parting of it's roots in the ſpring, or by ſetting cuttings of it during any of the ſummer months, in a moiſt ſoil. If the ſeaſon ſhould prove dry, theſe cuttings muſt be watered often till they have taken root, and after that they will not require any farther trouble, except good weeding. If any quantity of theſe plants is raiſed (for example, for diſtilling), they ſhould be ſet in beds about four feet wide, with a path a foot and an half or two feet broad, to go between the beds in order to water, weed, and cut the mint; and the diſtance between the plants ſhould be at leaſt five inches every way, that their roots may have room to ſpread: for this they do to ſo great a degree, that they will mat together, and rot each other, if they are ſuffered to ſtand above three years in the ſame bed.

When mint is cut for diſtilling, or for any medicinal uſe, this ſhould be done in very dry weather, when the plants are juſt coming into full bloom; for they are fulleſt of ſap, and higheſt in flavour, at that point of time. What is then cut ſhould be hung up to dry in a ſhady place, till it is wanted for uſe: but care muſt be taken not to hang it againſt a wall, becauſe this will make it turn black and mouldy. The ſame will alſo happen to mint that is cut in wet weather.

If the ſoil be fit for this plant, it will afford three general cuttings every year: but thoſe ſhoots which come out after July are ſeldom good for much. Theſe ſhould therefore be let ſtand till Michaelmas, when it will be right to cut the whole down cloſe to the ground, and, after carefully clearing away all the weeds, to ſift a little fine rich earth all over the beds, to the thickneſs of about an inch. This will give great vigour to the roots left in the ground, and will make them ſhoot out finely the next ſpring.

Some people, who are very fond of mint ſauce or ſallet in the winter or ſpring, take up the roots of this plant a little before Chriſtmas, or even ſomewhat earlier, and plant them pretty cloſe in a moderate hot bed, where they cover them about an inch thick with fine earth, and then lay mats, or a frame of glaſs, over the bed. The mint thus planted will come up, and be fit to cut in a month's time.

Spear mint and pepper mint are the ſorts generally uſed for diſtilling. The water drawn from theſe is ſalutary, and will warm the ſtomach as well as any dram. Perhaps too it might be rendered equally palatable, even to the lower claſs of people, (who intoxicate and kill themſelves with vile ſpirits diſtilled from grain), by a proper mixture of other agreeable aromatic herbs. If this could be done, and thoſe unhappy creatures could be brought to reliſh it; how many lives, and what great quantities of wheat, might it not be a means of ſaving!

*Pennyroyal* propagates itſelf very faſt by it's numerous trailing branches, which faſten to the ground at every joint, and from thence put forth roots and new ſhoots. Nothing is therefore requiſite in order to it's culture, but to cut off ſome of theſe rooted branches, and to tranſplant them into other beds. This ſhould be done in September, that the young plants may have time to fix, and gather ſtrength before the winter comes on: for in this caſe they will yield a much larger crop the next ſummer, than they would do if they were removed in the ſpring. They ſhould be ſet at leaſt a foot aſunder every way, that they may have ſufficient room to grow in: for the roots of this plant, like thoſe of mint, multiply ſo exceedingly, that, if they are planted at a ſmaller diſtance, they will mat together in the ſpace of a year, and afterwards ſoon rot one another in the winter. If the ſoil in which theſe plants are ſet is moiſt, ſtrong, and ſomewhat ſhady, (for that is their favourite ſituation) they will flouriſh amazingly.

*Roſemary* may be raiſed from ſeeds; but it is more commonly, and more eaſily propagated by planting ſlips or cuttings of it in a ſpot of freſh light earth, in the ſpring of the year, juſt before it's buds begin to open. When theſe plants have taken root, till which they muſt be watered gently from time to time, and ſhaded if the ſun be too powerful, they ſhould be tranſplanted into the places where they are to remain. This ſhould be done early in September, that they may have time to ſtrike out new roots before they can be in danger of being hurt by froſts; for thoſe which are ſet too late in the autumn ſeldom live through the winter, eſpecially if the weather prove very cold. Rather than do this, it is better to let them ſtand till the next enſuing March, and then to remove them after the hard weather is over: but in whatever ſeaſon they are tranſplanted, it ſhould not be during a cold drying eaſterly wind; becauſe this would ſoon ſhrivel up their leaves, and kill them. If a few warm ſhowers fall ſoon after they are ſet, they will ſoon take root, and after that they will require no farther care, than keeping them free from weeds. The diſtances between the plants ſhould be full ſufficient to allow for their utmoſt growth, ſo that they may not touch one another. That growth will be moſt luxuriant, eſpecially in the ſummer, if they are ſet in a rich mould: but then they will be moſt ſubject to be injured by froſts; nor will their odour be near ſo ſtrongly aromatic, as when they are raiſed on a poor, dry, gravelly ſoil. In this laſt, all the ſpecies of roſemary, except perhaps the ſtriped ſorts, and that in particular with ſilver ſtriped leaves, which is the moſt tender, will reſiſt all the cold of our ordinary winters extremely well. Many of them grow naturally upon dry barren rocks near the ſea, in the ſouth of France, in Italy, and in Spain, and thrive there ſo very much as to perfume the air to a conſiderable diſtance from the ſhore: and it is remarkable here, that, tender as theſe plants are when ſet in a garden, they will endure our bleakeſt winds, and ſevereſt winters, if, as it ſometimes happens, they chance to be rooted in the wall. The reaſon is, that they are then moſt concentrated, and conſequently ſtrongeſt, in their growth, and that their roots are in a dry ſituation.

*Rue* may be propagated either by ſowing it's ſeeds, which are ſmall, rough, and blackiſh, or by planting ſlips or cuttings of it, in the ſpring. The manner of cultivating theſe laſt is the ſame as for lavender and other hardy aromatic plants. It's ſeeds ſhould be ſown, and but lightly covered, in well-dug freſh earth; and when the plants are about two inches high, they ſhould be tranſplanted into a dry ſoil, where they are to remain. A moiſt ſoil would be apt to make them rot in the winter.

*Sage* is moſt commonly propagated by ſlips; not only becauſe it's ſeeds cannot always be obtained perfect in this country; but alſo, becauſe that is by much the eaſieſt and moſt expeditious way. Theſe ſlips ſhould be planted about the beginning of April, in a ſhady border, where they will ſoon take root, if they are watered now and then in caſe the ſeaſon be dry. When they are grown ſtrong enough to be removed, they ſhould be taken up with a ball of earth about their roots, and tranſplanted into the places where they are to remain. This ſhould be in a dry ſoil, where they may enjoy the benefit of the ſun: for if they are left to remain in moiſt ground, or in a ſhady ſituation, they will not well bear the inclemency of the winter: neither will they be ſo hardy, or ſo highly flavoured, if they are ſet in a rich ſoil, as when they grow on a barren, dry, and rocky ſpot. Keeping them clear from weeds is the principal part of their culture. The roots of all the common garden ſorts of ſage will laſt ſeveral years: but their tops ſhould not be cropped too often for uſe, leſt the plants ſhould become ragged, and there ſhould not be a due ſucceſſion of young ſhoots. The ſureſt way to obtain this, is to ſet a parcel of new ſlips every other year. The ſide ſhoots, and tops of the balſamic or tea ſage, which is generally dried and kept for uſe, ſhould be gathered in a very dry day, in the ſummer; but thoſe of the other ſorts are beſt when taken green from the plants.

The ſpecies of ſage moſt uſually cultivated in the kitchen garden, are, the large broad leaved ſort, of which the common green, the wormwood, the variegated green, the red, and the variegated red, are only accidental variations; the tea ſage abovementioned, which alſo has broad leaves, but more jagged at their edges; and the ſmall, or rather narrow, hoary leaved ſage, commonly called ſage of virtue. All the other ſorts of this plant are cultivated for variety, more than for uſe.

Sage, in general, flowers about the end of June and in July; and whenever it's ſeeds do ripen in this country, it is in the autumn.

*Savory* (the) cultivated in the kitchen garden is of two principal ſorts, viz. ſummer ſavory, and winter ſavory, the uſes of both of which are nearly the ſame.

The former of theſe is an annual plant, raiſed only from it's ſeed, which ſhould be ſown in the beginning of April, in a bed of looſe and light earth.

If the plants are not intended to be removed, their ſeeds ſhould be ſcattered thinly; but if they are to be tranſplanted, they may be ſown thicker. They muſt be kept clear from weeds, and are, in other reſpects, to be treated as before directed for marjoram.

Winter ſavory may be propagated from ſeeds ſown at the ſame time as thoſe of the ſummer ſort; or by ſlips off it's roots, for theſe are perennial, and will laſt ſeveral years, but as they do not put forth equally tender or well furniſhed ſhoots after they are grown old, the beſt way is to raiſe a ſupply of young plants every other year. The ſlips of the winter ſavory will ſoon take root and flouriſh; and they, as well as the plants of this ſpecies raiſed from ſeeds, will endure the greateſt cold of our winters, and have the moſt aromatic ſmell and taſte, when they are planted in a poor and dry ſoil. Wet ground is very apt to render them mouldy, and conſequently to make them rot. Mr. Miller [a] has noticed ſome of theſe plants growing upon the top of an old wall, where they were fully expoſed to the cold, and they there ſurvived ſuch ſevere froſts as killed moſt of thoſe of the ſame kind that were planted in the ground.

The winter ſavory flowers in June, and the ſummer ſavory in July; but the ſeeds of both ripen in the autumn, at no great diſtance of time from each other.

*Southernwood*, of which there are very many ſpecies, and ſome of them pretty enough, is not cultivated for any uſe that I know of, beyond decorating the bough-pots and little courts of the citizens of London. For that, indeed, it is well adapted, becauſe it endures the ſmoke of this town better than moſt other plants. It was formerly uſed in medicine, but is not ſo now. Nothing is eaſier than to propagate it by ſlips or cuttings, which need only be planted in good light earth, about the end of March or beginning of April, and watered two or three times a week, if the ſeaſon be dry, till they have taken root. This will alſo be accelerated by ſhading them in the middle of the day.

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[a] *Gardener's Dict.* Art. SATUREJA.

*Tanſey* is uſed in medicine, and in the kitchen: It is very eaſily propagated by it's creeping roots, which multiply ſo exceedingly as ſoon to ſpread beyond their intended limits, if there be not a path around the bed deſtined for them, and if this path be not dug up pretty frequently, ſo as to cut off the rambling ſhoots. The ſlips of this plant ſhould be ſet at leaſt a foot aſunder, and in beds by themſelves. They may be tranſplanted either in the ſpring or in the autumn, for they will ſoon take root; and they will thrive in almoſt any ſoil or ſituation.

The varieties of the common tanſey generally cultivated in the kitchen garden are, the double tanſey, as the gardeners term it, another with variegated leaves, and a third with larger leaves which have but little ſcent. The other ſorts of tanſey, of which there are ſeveral, are moſtly too tender for the open ground in this country.

*Thyme*, of which the botaniſts enumerate nine different ſpecies, beſides ſeveral varieties, is propagated either by ſeeds, or by parting it's roots. The moſt uſeful ſort, either for culinary purpoſes, or for medicine, is the broad leaved thyme, moſt commonly cultivated in the kitchen garden; for the narrow leaved kinds never grow ſo large. Their culture is, however, exactly the ſame.

The ſeeds of thyme, if it be raiſed from thence, ſhould be ſown either in March or October, but the former of theſe months is beſt, in a well dug bed of light earth: taking care, as they are very ſmall, not to drop them too cloſe together, nor to bury them deep, for this laſt would make them rot. When the plants are come up, they ſhould be carefully overlooked and cleared from weeds, and if the ſeaſon be dry, their growth will be greatly promoted by watering them twice a week, for ſome time. In June, if it be a ſpring ſowing, the plants ſhould be thinned to the diſtance of ſix inches aſunder every way, that they may have room to ſpread; and thoſe which are drawn out may be ſet in other beds, at the ſame diſtance from each other. They muſt be watered till they have taken root, and will then require no farther care, except weeding them, till the winter, when they may be pulled up, and laid by in a dry place, for uſe. The autumnal ſowing ſhould be thinned as before, early the next ſpring, if it be let ſtand till then; for there will be little danger of it's reſiſting the ſevereſt winter of this country, eſpecially if the plants grow on a dry, poor, and ſtony land. In rich ground, indeed, where they grow luxuriantly, they are ſometimes deſtroyed by ſevere froſts. Thyme will even flouriſh upon a ſtone wall.

If the plants are propagated by parting their roots, this ſhould alſo be done in March or October. The old plants ſhould be taken up, their roots ſhould be ſlipt into as many parts as can be, and theſe ſlips ſhould be ſet ſix or eight inches aſunder every way, in beds of freſh light earth. If the ſeaſon is dry, they muſt be watered there till they have taken root; and with only weeding of them afterwards, they will ſoon be fit for uſe.

To ſave the ſeeds of thyme, ſome of the plants ſhould be left unremoved till the next ſpring. They will then flower in June, and their ſeeds will ripen in July. Theſe muſt be pulled up and beaten out as ſoon as they are ripe; for the firſt ſhower of rain would otherwiſe waſh them all out of their huſks.

Thyme is ſo great an impoveriſher of the earth, that no crop will thrive well where that ſtood the year before, unleſs the ground be trenched deeper than the thyme rooted, and at the ſame time enriched with dung, or ſome other ſuitable manure.

## *ARTICLE* VI.

### *Of Plants which are commonly raiſed in a Hot-Bed.*

BEFORE I proceed to the particular inſtructions of experienced gardeners for the culture of theſe plants, it will be right to give ſome general directions for making the hot beds on which they are to be raiſed. This, for all the common and neceſſary purpoſes of the kitchen garden, is formed with dung: for ſtoves, and beds of tanner's bark, being uſed for the rearing and preſerving of curious exotics, belong to a more refined branch of horticulture, than is intended to be treated of in this work.

A quantity of new horſe dung, taken from the ſtable, together with ſome, but not too much, of the ſtraw which has been uſed there for litter, ſhould be thrown up in a heap, to ferment in a remote corner; and a few ſea-coal aſhes ſhould be mixed with it, to render the warmth of the dung the more laſting. At the end of ſix or ſeven days, this heap ſhould be turned over, all it's parts ſhould be thoroughly mixed together, and the whole ſhould then be laid up again for five or ſix days more, by the end of which it will have acquired a ſufficient degree of heat. The quantity of dung thus fermented ſhould be proportioned to the ſize of the intended bed, or beds. One good load at leaſt will be requiſite for each light of a hot bed that is made early in the year: but ſomewhat leſs may do for ſuch as are made in a milder ſeaſon.

A ſuitable and well ſheltered ſpot being choſen, in as warm and ſunny a ſituation as can be, either in a corner of the garden, or, which is moſt eligible, juſt without it's wall, as before adviſed [b], the better to avoid filth and litter; a trench, of length and breadth ſuited to the frames intended to be uſed, ſhould be dug in it, about a foot, or a foot and an half deep, if the ground be dry, but not above ſix inches deep in a moiſt ſoil. The dung, prepared as before, ſhould be wheeled into this trench, and there ſpread as even as poſſible over every part of it, with particular care to ſtir it thoroughly, and beat it down very cloſe, with a fork, as it is laid on; for this will help to prevent worms from making their way through it. If the dung is pretty full of long litter, it ſhould not only be beaten, but alſo trodden down cloſe and equally, the better to guard againſt one of the greateſt dangers theſe beds are liable to, which is, their heating at firſt too violently, and afterwards cooling too ſoon. The bottom part of the heap of dung, which is generally free from litter, ſhould alſo be laid on the top of the bed, the more effectually to confine the ſteam to the dung; and, ſtill farther to keep down the heat, and hinder it from riſing ſo ſtrongly as to burn the roots of the plants ſet in the mould over it, as ſometimes happens if this precaution is not taken; a good way is to ſpread a layer of neat's dung all over the ſurface of the bed of horſe dung: but if, with all this, the bed does not cool ſo faſt as is deſired, it may ſoon be reduced to a moderate temperature, by leaving it a little while totally uncovered, and thruſting a large ſtick into the dung, on each ſide of the bed, in two or three places, to make holes, out of which the great ſteam will quickly paſs off.

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[b] See *p.* 20.

If the hot bed is deſigned for early cucumbers, or for melons, it ſhould not be covered all over with earth at firſt, but only a hillock of mould ſhould be laid in the middle of each light, the plants ſhould be ſet therein, and the remaining ſpace ſhould be earthed up from time to time, as their roots extend, in the manner which will be more fully explained under each of theſe articles. If it is intended for other plants, two or three days ſhould be allowed for the firſt ſteam to paſs off, before the earth is laid upon the dung.

The depth of the dung ſhould, in general, be at leaſt three feet, and that of the mould upon it about ſix inches.

During the firſt week or ten days after the bed is made, the glaſſes over it ſhould not be ſhut down cloſely at night, and care ſhould be taken to raiſe them up in the day time, that the ſteam which always ariſes copiouſly from dung while it is freſh, may have room to fly off: but as the heat abates, the covering ſhould be cloſer, for fear of ſtinting the growth of the plants, or perhaps of killing them.

To reſtore warmth to one of theſe beds after it has cooled to much, a pretty good quantity of new hot dung ſhould be laid up to it's ſides. This will revive it's heat for a conſiderable time; and, as the ſpring advances, the ſun will ſupply the after loſs of the warmth of the dung. To aid this, it will be adviſeable then to lay ſome mowings of graſs around the ſides of the bed, eſpecially if the nights ſhould be cold, as they often are in May, even to ſuch a degree as to prove very hurtful to tender plants in hot beds, if great care is not taken of them.

Thoſe who have not the convenience of frames and glaſs lights, may, though it is not near ſo good a method for plants which require very careful and tender treatment, arch their hot beds over with hoops, and cover theſe with baſs mats, which may be taken quite off in the middle of a warm day, and put on again at night, ſecuring their bottoms well all around, by laying upon them bricks which will keep them down very cloſe.

When the firſt extreme heat of the bed is over, which may be known by thruſting in one's finger, or by pulling out and feeling the end of a ſtick that has been ſtuck pretty deep into it for ſome time, it is fit for ſowing the ſeeds, or ſetting the plants, which are intended for it.

The whole of the ſpace actually uſed for hot beds, or for a melon ground, as it is commonly called, ſhould, beſides it's other more diſtant ſhelter, be defended from every adventitious wind, by fencing it cloſely round with a reed hedge made in pannels, ſo that any part of it may be taken up, and eaſily removed, as occaſion may require[c]. This hedge ſhould be ſix or ſeven feet high, and it's diſtance from the bed ſhould be at leaſt ſuch as to afford convenient room for a man to go between them with a wheel-barrow, after the ſides of the bed have been extended by the addition of freſh dung, or mowings of graſs, if either of theſe ſhould be neceſſary. It ſhould alſo be ſo far from the bed, as not to obſtruct the rays of the ſun during any part of the day.

The eaſt wind and the north are moſt to be feared for hot beds, in the ſpring, and conſequently moſt neceſſary to be guarded againſt in that ſeaſon, becauſe they then generally blow ſo cold and ſtrong, that it would be difficult to admit with ſafety a proper ſhare of air to the young plants expoſed to either of thoſe aſpects; and in the ſummer and autumn, danger may be apprehended from the ſouth-weſt winds, becauſe they are apt to be very boiſterous in this country. A hot bed is therefore in the moſt eligible poſition, when it lies open to the ſouth, or inclines a little to the eaſt, and is ſheltered from the other points, by diſtant trees, beſides the reed hedge of which I have been ſpeaking.

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[c] See *p.* 21.

The plants commonly raiſed in a hot bed, for the uſe of the table, are the following.

*ASPARAGUS*, which I did not, at firſt [d], intend to treat of in this light, becauſe it is not worth the huſbandman's while to be at the charge and trouble of forcing theſe plants, as the gardeners term it, that is to ſay, of raiſing them out of their natural ſeaſon, by the help of hot beds: but as ſome country gentlemen, who can better afford it, may like to have a few diſhes of them at a time when the common beds in their kitchen garden will not furniſh any; I ſhall here give a few ſhort directions for obtaining them in any part of the winter.

About five or ſix weeks before the time at which it is deſired to have aſparagus fit to cut, a ſufficient number of good roots, tranſplanted from the ſeed bed two or three years before, ſhould be ſet in a hot bed prepared as above directed. The beſt ground to take them from, for this purpoſe, is a low, moiſt, rich ſoil; becauſe they will have grown largeſt there. One rod of ſuch land planted in ſix rowed beds, the rows at ten inches diſtance from each other, and the plants about eight or nine inches aſunder in the rows (for theſe are the ſpaces commonly allowed when they are intended for the hot bed), will generally furniſh roots enough for one light. Moſt of the kitchen gardeners about London uſe, for their forced aſparagus, roots which have been tranſplanted but two years from their ſeed bed: but unleſs they have been ſet in very good ground, they will be but weak, and conſequently produce only poor thin ſhoots, in comparifon of thoſe which good roots of three years old will yield.

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[d] See *p.* 61.

When the hot bed, covered with about ſix inches thick of earth, is of a proper temperature to receive them, that is to ſay, when the firſt violence of it's heat is ſo far abated that there is no danger of it's burning them, a row of theſe roots ſhould be laid againſt a narrow ridge of earth raiſed about four inches high at one end of the bed, and row after row ſhould then be continued, as cloſe as poſſible to each other, but in ſtrait lines, till the whole is covered. The crowns of the roots ſhould be ranged exactly level, their buds ſhould ſtand upright, and a ſmall quantity of fine mould ſhould be laid between each row. An edging of ſtiff earth muſt then be laid up to the roots, along the outſides of the bed, which are bare, to keep them from drying; and two or three ſharp pointed ſticks, about two feet long, ſhould be thruſt down between the roots, in the middle of the bed, at ſome diſtance from each other, for the uſe before mentioned of knowing the temperature of the bed, by pulling them out and feeling their loweſt end, and of judging accordingly whether it's heat requires to be increaſed, or diminiſhed; for both which directions have already been given.

In a few days, leſs than a fortnight, after the bed has been planted, the crowns of the roots muſt be covered with fine earth, to the depth of about two inches:

inches; and when the buds have pierced through this, the thickneſs of about three inches more of earth ſhould be ſifted over them, ſo that, in all, the covering may be five inches above the crowns of the roots; for that will be ſufficient for the growth of the ſhoots. After this, a band of ſtraw, or long litter, about four inches thick, ſhould be faſtened round the ſides of the bed, by running through it into the bed, ſtrong, ſtrait, and ſharp pointed ſticks, about two feet in length. The upper part of this band ſhould be level with the ſurface of the bed; and upon it ſhould be placed, after it is thus fixed, the hot bed frames with their glaſſes. Theſe muſt be kept cloſe covered with mats and ſtraw in bad weather, as well as every night: but the covering ſhould be taken off in the day time, eſpecially when the ſun appears, that it's ſhining upon the plants, through the glaſſes, may give a good colour to the aſparagus.

If a bed of this ſort works kindly, it will begin to produce ſhoots fit for cutting in about five weeks, and will continue ſo to do for about three weeks, in the courſe of which each light properly planted with good roots will yield about three hundred heads of aſparagus. If, therefore, it be deſired to have a ſucceſſion of theſe plants until the natural ones come in, a new hot bed muſt be made every three weeks, from the ſeaſon of the firſt, which may be about Chriſtmas, to about the firſt week in March. This laſt will continue good till the natural ſeaſon of aſparagus comes round: and it is to be obſerved, that the lateſt made beds will always produce the largeſt and beſt coloured heads, and that theſe will be fit to cut a fortnight ſooner than thoſe of the firſt; becauſe they will enjoy a greater ſhare of ſun, and, if the ſeaſon be favourable, ſometimes of air, which laſt will alſo render them better taſted.

*Capſicum* (the) commonly called Guinea pepper, or Bell pepper, on account of the ſhape of it's pods, and yet more properly named Indian pepper, becauſe it is a native of both the Indias, is propagated here by ſeeds ſown on a hot bed in the ſpring. When the plants which ariſe from them have about half a dozen leaves, they ſhould be tranſplanted into another hot bed, at the diſtance of four or five inches from each other, and there be ſhaded in the day time until they have taken root, after which a pretty large ſhare of air ſhould be admitted to them in warm weather, to prevent their being drawn up weak; and they ſhould alſo be frequently watered. Towards the end of May, they ſhould be hardened by degrees to bear the open air, and in June they ſhould be taken up with as much earth as poſſible about their roots, and planted in a ſpot of rich ground, in a warm ſituation, about a foot and an half aſunder. Here alſo they ſhould be ſhaded and watered till they have taken root, and the watering ſhould be continued afterwards in dry weather, as a means of greatly promoting their growth, of rendering them more fruitful, and of increaſing the ſize of their pods. With this management, they will yield at leaſt two crops of fruit in the ſame ſummer (for they are annuals) if the ſeaſon be not too cold.

This ſort, which Tournefort intitles [e] *Capſicum fructo longo, ventre tumido, per ſummum tetragono*, Capſicum with a long fruit, having a ſwelling belly, and ſquare at the top, is the only kind proper for pickling; nor is it cultivated for any other uſe. It's pods are tenderer and more fleſhy than thoſe of any other ſpecies of this plant. They grow from an inch and an half, to two inches, in length, and are very thick at their top, from whence they diminiſh gradually down to their point, generally with a pretty many wrinkles.

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[e] *Inſt.* 153.

The manner of pickling theſe pods is thus: they muſt be gathered before they arrive to their full ſize, while their rind is yet tender; and after their ſeeds have been taken out, which is done by ſlitting them down on one ſide, they are ſoaked for two or three days in ſalt and water: they are then taken out of this, and drained, and boiling vinegar is poured on them, in ſufficient quantity to cover them: after this they are ſtopped down cloſe for two months, and at the end of that time they are boiled in the vinegar, to make them green. No ſpice whatever is put to them; and many reckon them the wholſomeſt and beſt pickle in the world.

To ſave the ſeeds of the capſicum for future ſowing, one of the ſtrongeſt, forwardeſt, and largeſt podded plants ſhould be left untouched, particularly with regard to the not gathering of it's firſt formed fruits, which it is eſſential to leave, that they may have the more time to perfect their ſeeds before the froſts come on in autumn; for early froſt generally kills theſe plants. When the fruit is ripe, at which time it is of a fine red colour, it ſhould be cut off, and hung up in a dry room till it's ſeeds are wanted in the next ſpring.

It is from the fruit of a ſpecies of this plant, which the Americans, among whom it grows naturally, diſtinguiſh by the name of Bird pepper, and which the botaniſts entitle *Capſicum caule fruticoſo, fructu parvo ovato erecto*, Capſicum with a ſhrubby ſtalk, and a ſmall oval fruit growing erect, that the Cayan butter, as it is frequently termed, though more properly called Cayan pepper, is made. The inhabitants of America, who look upon theſe pods as the beſt of all ſpices, call them pepper pots, and prepare them as follows:

They take the ripe pods of this ſort of capſicum[f], and dry them well in the ſun, then put them into an earthen or ſtone pot, with flour between every layer of pods, and ſet them in an oven, after the bread has been drawn out, that they may be thoroughly dried. After this, they cleanſe them well from the flour, pluck off the remaining ſtalks, if any have been left, and beat or grind the pods to fine powder. To every ounce of this they then add a pound of wheat flour, and as much leaven as is neceſſary to make it ferment; and after it has been well mixed and wrought, they make it into ſmall cakes, which they bake in the ſame manner as is uſed for common cakes of equal ſize. They then cut theſe cakes into little bits, and bake them again, till they are as dry and hard as biſcuit; and finally, they pound theſe bits very fine, ſift them, and keep their powder for uſe.

I have tranſcribed this receipt, firſt, becauſe the ſame method may poſſibly be practiſed here, by raiſing this plant in a hot bed, and afterwards treating it like the other ſorts of capſicum, or perhaps it may likewiſe be done with the ſpecies which we commonly uſe for pickling; and ſecondly, which is the ſtrongeſt reaſon, becauſe this preparation is ſaid, not only to give a better reliſh to meat or ſauce, than the ordinary round grained Eaſt Indian pepper (which coſts this nation a large ſum every year); but alſo to be more cordially comforting to a cold ſtomach, and more effectual to diſpel wind, phlegm, or viſcous humours, and to help digeſtion.

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[f] MILLAR's *Gardener's Dict.* Art. CAPSICUM.

*Cucumbers*, for very early ſhew, that is to ſay, to decorate the table at a time when no prudent man would chooſe to eat them, are nurſed in ſtoves by ſome fantaſtical gentry, who pique themſelves on having this fruit fit to cut in every month of the year. But I ſhall here content myſelf with relating the more rational, and far leſs troubleſome, practice of thoſe who have patience to wait till they can be produced in the natural ſeaſons.

To have as early cucumbers as the not too much forced courſe of vegetation can yield in this country, their ſeeds ſhould be ſown, about the middle of March, or a little later if the ſpring be backward, either under a bell glaſs placed upon a ſpot of hot bed, or at the upper end of a more regular hot bed covered with frames, where they will not then take up the room of other plants. The rules before laid down for the due temperature of the hot bed ſhould be attended to here; and when theſe plants are come up, they ſhould be tranſplanted into another moderate hot bed, at the diſtance of about two inches aſunder. Here they ſhould be covered with bell or hand glaſſes ſet quite cloſe to each other, and they ſhould be ſhaded, and ſparingly watered, until they have taken root. They ſhould alſo be aired, as much as the weather will permit, by raiſing up the ſide of the glaſs oppoſite to the wind, in order to ſtrengthen them, and when they have begun to put out their rough leaves, they muſt be re-tranſplanted on the ridges where they are to remain.

Theſe ridges are made with new horſe dung, in the ſame manner as before directed for the hot bed, excepting that they are neither ſo thick nor ſo wide. About two feet four inches will be ſufficient for the breadth of the trenches in which they are made; but their length may be whatever is moſt convenient, according to the number of plants intended for them. The trenches for theſe ridges ſhould be about ten inches deep in dry ground; but very little earth need be dug away for them if the ſoil is wet. About one cart load of dung will make a ridge long enough for five or ſix holes of cucumbers, at the diſtance of about three feet and an half from each other. This ridge of dung, being well beaten down and levelled at top, ſhould be covered with about four inches deep of earth, of which the ſame thickneſs ſhould alſo be laid over it's ſides. Hillocks of mould ſhould then be raiſed up in the middle of the ridge, at every diſtance at which the plants are to be ſet; and after theſe have been cloſely covered with the glaſſes during four and twenty hours, in order to warm the earth, and thereby fit it for the reception of the plants, they ſhould be ſtirred up by hand, ſo as to make a little hollow in the middle of each, in the form of a baſon. Four plants ſhould then be ſet, as far as can be from each other, in each of theſe hollows, where they muſt again be watered and ſhaded until they have taken root; and after this they muſt be aired, by raiſing the glaſſes on the ſide oppoſite to the wind, in proportion to the warmth of the weather: but they ſhould be raiſed thus only in the middle of the day, until the plants begin to fill them; for after that, they ſhould be propped up with a forked ſtick on the ſouth ſide, to a height proportioned to the increaſe of the plants, which muſt be carefully preſerved from being ſcorched by the ſun. This will alſo harden and prepare them for the open air, to which they ſhould not, however, be expoſed too ſoon, becauſe we frequently have morning froſts in May, which they would not be able to reſiſt. Rather than run any hazard of this kind, the glaſſes ſhould be kept over them as long as can be without damaging the plants; and this may be for a conſiderable time, if the glaſſes are raiſed all round, by ſetting them on three bricks.

About the end of May, when the weather begins to be ſettled and warm, and rather in a cloudy day which ſeems to promiſe rain, than in a very dry and ſunny one, the plants ſhould be gently turned down from out of the glaſſes; and theſe ſhould then be ſupported over them at the height of four or five inches from the ground, by three forked ſticks which will hold them up very ſecurely, and prevent their bruiſing the ſhoots of the plants underneath: for it is beſt not to remove the glaſs entirely before the latter end of June or the beginning of July, becauſe they will preſerve a moiſture about their roots much longer than if they were quite expoſed to the open air. The plants thus turned down will have made a conſiderable progreſs by the end of three weeks, eſpecially if the weather has been favourable; and then it is that the ſpaces of ground between the ridges, or along the ſides of the ridge if there be but one, ſhould be dug up, and added to the bed, or beds, that the roots of the plants may be enabled to ſtrike into it; for they will extend themſelves a great way (ſome ſay as far as the vines), if they are not cramped. The runners of the vines ſhould be laid in exact order, without tumbling them too much, or bruiſing or breaking of their leaves. Some pin them down gently with little wooden hooks, to prevent their being blown about by the wind. After this, they will require no farther care, except keeping them clear from weeds, and watering them when neceſſary, that is to ſay, when their greater leaves droop and hang down to the ground. But here it is to be obſerved, that, though pretty frequent watering of them increaſes their fruitfulneſs, they are beſt taſted, and wholſomeſt, when they have had but little water; and, though they ſhould be watered ſometimes in dry weather, they ſhould be carefully defended from rain when it is cold. The ridges thus managed will yield large quantities of fruit, from June till the latter end of Auguſt. Mr. Mortimer recommends[g] nipping off the top ſhoots of cucumber plants after they have put out three or four joints, as a means of making them knit the ſooner for fruit.

It is from cucumbers planted on ridges, like the above, that moſt of the gardeners about London ſave their ſeeds. To this end, they leave a number of the earlieſt and fineſt fruit upon the vines, until their ſeeds are perfectly ripe; and then, when the outer cover begins to decay, they cut them open, and ſcrape out their ſeeds, with the pulp, into a tub, which they cover over with a board, to keep out all filth. They let theſe ſeeds and pulp remain thus for eight or ten days, only ſtirring them well with a ſtick, to the bottom, every day, in order to rot the pulp, and make it ſeparate the more eaſily from the ſeeds. They then pour water into the tub, and ſtir the whole well about, till there ariſes a ſcum, after which they let the ſeeds ſettle to the bottom, and pour off the water. This they repeat two or three times, till the ſeeds are perfectly cleared from the pulp. They then ſpread them upon a mat expoſed to the ſun and open air for three or four days till they are quite dry, and after this they put them into bags and hang them in a dry place, where vermin cannot come to them. They will keep good for ſeveral years, but are thought to produce the leaſt luxuriant, and therefore moſt fruitful, plants, when they are three or four years old.

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[g] *Art of Huſbandry, Vol.* II. *p.* 154.

To avoid the trouble of making beds, or ridges, of dung on purpoſe for them, as above deſcribed, (which is undoubtedly the ſureſt way to have early fruit), many people, who are leſs ſollicitous about the earlineſs, or even the great plentifulneſs of theſe crops, than the trading gardeners around London are obliged to be, only dig holes of the ſize of a buſhel, fill them with warm ſtable dung, then ſet in the middle of them four or five cucumber plants, with as much mould as poſſible about their roots, and afterwards earth them up in the form of a baſon, to render the watering of them the more effectual. They ſhade them till they have taken root, and cover them for a while with bell or with hand glaſſes, if they have any; or they even truſt them at once to the open air. If the plants thrive, three of them will be ſufficient in a hole; and then the reſt of them may be plucked up, or tranſplanted elſewhere. Some even raiſe them from their ſeeds planted in holes of this kind, without any previous hot bed, and they do very well, if the ſeaſon be at all favourable.

The time for ſowing the latter crop of cucumbers, commonly called picklers, is the beginning of June. The London gardeners generally ſet theſe between their wideſt rows of colliflowers, which are four feet and an half aſunder. To this end, they dig ſquare holes about three feet and an half from each other, breaking the earth well, and hollowing the ſurface of each hole, with their hands till it is like a baſon. They then plant eight or nine ſeeds in the middle of each of theſe ſpots, and cover them with earth to the thickneſs of about half an inch. If the weather is very dry, they water them gently at the end of a day or two. In five or ſix days the plants will appear above ground; and particular care muſt be taken then to defend them from birds, eſpecially ſparrows, which will otherwiſe ſoon pinch them off, and thereby fruſtrate all expectations of a crop: but this danger will be over in little more than a week; for the ſparrows will not meddle with them after they have expanded their ſeed leaves. Care muſt alſo be taken to continue to water them gently, from time to time, according as the ſeaſon is more or leſs dry, and when they begin to ſhew their third leaf, which is the firſt of their rough ones, all the weakeſt plants ſhould be pulled up, leaving in each hole only four of the moſt promiſing and beſt ſituated. The ground about theſe ſhould then be well ſtirred with a ſmall hoe, to deſtroy the weeds, and earth up the plants, around the ſtems of which the mould ſhould afterwards be gently preſſed down by hand, the better to ſeparate them from each other as much as can be without hurting them. This being done, they are watered a little to ſettle the earth about them, and at ſuch other times as the dryneſs of the weather may render neceſſary: but, above all, they muſt be kept clear from weeds. When the colliflowers are quite removed, the whole ground ſhould be thoroughly hoed and cleaned, freſh earth ſhould be laid up around the plants, ſo as to deepen the hollows in which they ſtand, that they may the better contain water when it is given them, and their vines ſhould be ſpread out carefully in the order they are to run, in ſuch manner that they may not croſs or be entangled with one another. A little earth ſhould then be laid, and gently preſſed down, between the plants, the better to ſeparate them every way, and a gentle watering now, and as often afterwards as the ſeaſon ſhall require, will forward their growth. With this management, theſe plants will begin to yield young cucumbers, fit for pickling, about the latter end of July, or early in Auguſt.

About fifty or ſixty of theſe holes will be neceſſary for a middling family; becauſe a ſmaller number of them will not afford fruit enough at one gathering to requite the trouble and expence of pickling, and they never are ſo good if they are gathered long before they are put into the vinegar. Fifty holes will ſeldom furniſh more than two hundred cucumbers fit to gather at a time; and this may be repeated twice a week as long as the ſeaſon laſts, which generally is five weeks. What are not wanted for pickling, may be left to grow till they become fit to eat.

Though M. Duhamel has not given us any experiments on the culture of cucumbers according to the principles of the new huſbandry, there can be no room to doubt of their ſucceeding perfectly in that way, ſince M. de Chateauvieux raiſed excellent melons, which are a much more tender fruit, in beds of common earth, in the open field, merely by keeping the ground in fine order by a judicious uſe of the horſe-hoe, without the help of either dung, hot bed, or glaſſes over them, and they were in all reſpects preferable to any in his garden [h]. This ſurely merits the attention of all kitchen gardeners, and ſingularly of thoſe near London, where land and labour bear extraordinary prices.

*Melons*, to have a continuation of them long, ſhould be ſown at two, or rather three, different times. The firſt ſhould be in the ſecond week of March, if the ſeaſon is forward; but otherwiſe it had better be deferred a few days longer, becauſe the ſucceſs of theſe plants depends greatly on their being raiſed ſtrong, which they cannot well be if the weather ſhould prove ſo bad after they are come up, that a ſufficient quantity of freſh air cannot be admitted to them. The ſecond ſowing ſhould be at the end of March; and the third, if there be a third, ſhould be about the tenth or twelfth of April. Theſe are the directions of Mr. Philip Miller, whoſe long experience and excellent obſervations have enabled him to treat this ſubject ſo much better than any other had ever done before him, that I cannot do juſtice to him, or to my readers, but by giving the ſubſtance of his judicious inſtructions on this head; eſpecially as they contain ſeveral new and eſſential improvements[1].

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[h] DUHAMEL, *Culture des Terres, Tom.* IV. *p.* 455.

The melons which beſt deſerve culture are, the Cantaleupe, the Romana the Succado, the Zatte, the ſmall Portugal, and the black Galloway: for our common ſorts, and thoſe which moſt of the trading gardeners around this metropolis raiſe for the markets, where there ſize is chiefly regarded, are not worth the trouble and expence beſtowed upon them, otherwiſe than as they bring in a profit to the cultivator.

The Cantaleupe, as it is called, by way of pre-eminence, particularly by the Dutch, who cultivate very few other ſorts, and never ſubjoin the word melon when they ſpeak of this, though they apply that diſtinctive appellation to every other kind, is held in the greateſt eſteem by all the curious in Europe. It derives it's name from a place (where the Pope has a country ſeat) about fourteen miles from Rome, where it has long been cultivated: but it was firſt brought thither from that part of Armenia which borders on Perſia, where this fruit grows naturally in vaſt abundance. It's outer coat is very rough, full of knots and wart-like protuberances; and it's fleſh, which is generally of an orange colour, though it is green in ſome, but theſe are not ſo good, is ſingularly delicious, when in perfection, and remarkable for the ſafety with which it may be eaten; for it does not offend even the moſt tender ſtomachs.

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[1] *Gardener's Dict.* Art. MELO.

The Romana is a good melon, when it is well conditioned, and produced by a perfectly healthy plant, in a dry ſeaſon. It may be ripened ſooner than the Cantaleupe, and therefore merits the attention of thoſe who are fond of having early melons.

The Succado is alſo a very good ſort, and will yield early fruit: but neither it, nor the Romana, can be compared to the Cantaleupe, when this laſt is in ſeaſon.

The Zatte melon is likewiſe well taſted; but it's fruit is ſo very ſmall (ſeldom exceeding the ſize of an orange), and the fleſh in it ſo little, that it is ſcarcely worth cultivation. It is ſomewhat flat at both ends, and it's coat is warted like that of the Cantaleupe.

The ſmall Portugal melon, which ſome call the Dormer melon, may alſo be cultivated for an early crop. Is is a pretty good fruit, and grows plentifully; for which reaſon many people, who chooſe quantity rather than quality, and whoſe palates are not nice, give it a ſort of preference to moſt other ſorts: but it falls greatly ſhort of the Cataleupe, in point of flavour.

The black Galloway, which was brought from Portugal, many years ago, by Lord Galloway, is the beſt of all melons for an early crop; for it will ripen in a ſhorter time from the ſetting of it, than any other ſort; and it's fruit is by no means bad when it is ſuffered to ripen naturally. This would, therefore, certainly be a very proper ſort to cultivate even in the open field, according to the principles of the new huſbandry, by a proper application of which to the melon, we have juſt ſeen [k] how well M. de Chateauvieux ſucceeded. The ſeeds of the right black Galloway are, indeed, not eaſily met with now in this country; becauſe it has degenerated by growing among other ſorts, the male duſt (farina) of whoſe bloſſoms has been wafted to, and has impregnated, the flowers of this: for, to preſerve any particular ſort of melon in perfection, no other plant of a different kind, though of the ſame genus, no cucumber, no gourd nor any ſimilar growth, ſhould be permitted to blow near it.

To the want of care in this important, though too generally unheeded, caution, is owing the complaint of many lovers of this fruit, who, not knowing the true cauſe, have imputed the gradual diminution of the goodneſs of their melons to their having been too long cultivated from ſeeds ſaved in the ſame garden, and have therefore held it to be abſolutely neceſſary to procure a frequent change of ſeeds from diſtant parts. That a change of ſeeds now and then is beneficial, and even adviſable, is readily allowed in regard to this, as well as for all other vegetables; but the great difficulty is, to get them from people who have ſaved them with due care; for all hired, or otherwiſe mercenary, gardeners are apt to be very blameably negligent in this reſpect. Even Mr. Miller, though a member of the botanic Academy at Florence, and very ſollicitous to have the right ſort, could not, for ſeveral years, procure any good ſeeds of the true Cantaleupe melon, notwithſtanding that ſeveral parcels were ſent to him, from Italy, as ſuch, by perſons who, he thought, could not be deceived in their choice, and who lived near the place of their growth. He therefore judiciouſly warns all perſons not to depend upon ſeeds brought from abroad, either by thoſe who import them for ſale, or by gentlemen; and declares his own reſolution, founded on repeated diſappointments, to be, never more to try any of them, unleſs he receives them from a ſkilful perſon who has himſelf eaten of the fruit from which he ſaved them: "for," adds, he, "in Italy, Spain, Portugal, and many parts of France, the gardeners "are very careleſs in the choice of all their ſeeds, "but of the melons they are remarkably ſo; and "as for thoſe which come from Conſtantinople, "Aleppo, and other parts of Turky, I have rarely "ſeen one melon produced from thoſe ſeeds, which "was tolerable."

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[k] *Page* 168.

Melon ſeeds ſhould be at leaſt three years old, and not more than ſix, or at moſt ſeven, when they are ſown: for though they will grow at the age of ten or twelve years, and at leſs than three, yet the fruit produced by them will, like that of light ſeeds which ſwim upon the water when taken out of the pulp, not be near ſo thick fleſhed, ſo firm, ſo moiſt, or ſo well taſted, as what is raiſed from heavy ſeeds kept to a proper time, even though they be taken out of the ſame melons. Mr. Miller has made the trial ſeveral times, and always found this to be the event.

The culture of all ſorts of melons, of which there are many varieties beſides the abovementioned, though not of value enough to be particulariſed here, is exactly the ſame. The two firſt ſowings of them, that is to ſay, thoſe made in March, ſhould be under frames, and therefore theſe may be placed at the upper ſide of a cucumber bed, if there be one in readineſs; otherwiſe a hot bed muſt be made on purpoſe for them, with new horſe dung, in the manner before directed for cucumbers, like which they are to be raiſed and managed in all reſpects, till they are planted out where they are to remain. The third ſowing, of which the plants are generally reared under bell or hand-glaſſes, or under frames covered with oiled paper, ſhould not be earlier than the tenth or twelfth of April, leſt theſe plants, if they thrive well, ſhould extend their ſhoots to the ſides of the glaſſes before it will be ſafe to let them run out, on account of the ſharp morning froſts which are frequent in this country even in the middle of May: nor muſt they on the other hand be cramped in the glaſſes, becauſe they would then be in equal danger from the heat of the ſun in the day time. If they do grow ſo as to exceed the limits of their glaſſes ſooner than it may be ſafe to expoſe them to the air, the projecting ends of their vines muſt, in that caſe, be ſheltered with mats, to defend them from the cold. For theſe reaſons it is moſt adviſeable to ſet the ſeeds of ſuch plants as are to be reared under hand glaſſes, a little later than thoſe which are intended for the much more ſpacious coverings of oiled paper: and likewiſe for the ſame reaſons, it is beſt, in this climate, not to attempt to have melons ripe earlier than the middle of June, from which time they may be had in plenty till the end of September, if they are rightly managed: nay, when the autumn has continued favourable, Mr. Miller has had them very good, even till the end of October.

When the beds, or, as the gardners term them. the ridges, in which theſe plants are to be ſet to remain are of a proper warmth (but not before, leſt the two great violence of the heart at firſt ſhould burn the earth laid upon them), a covering of two inches thick of mould will be ſufficient to begin with, except in the middle of each light, where a hill of it ſhould be raiſed eighteen inches high, or more, terminating in a flat cone, in the top of which the plants are to be placed. In two or three days, this will be ſufficiently warmed to receive the plants, which always ſucceed beſt when they are tranſplanted young; and the moſt proper time for removing them is the evening, when a little wind is ſtirring. They ſhould be carefully taken up with a trowel, ſo as to preſerve all their fibres, and as much earth as poſſible about them; for theſe plants are much tenderer than thoſe of cucumbers. The Cantaleupe melon is particularly ſo: for it will be long before that recovers itſelf, after being tranſplanted, if this is not done ſoon after it has put out it's third, or what the gardners call it's rough, leaf. If this happens before the beds are ready, the beſt way is, particularly for the Cantaleupe, which requires the niceſt management, to take up the plants as ſoon as they are fit for removing, to put each of them into a ſeparate ſmall garden pot, and then to plunge theſe into the hot bed where they were raiſed, or into a cucumber bed if there be room, in order that they may be brought forward; and when the bed, or ridge, where they are to remain is ready, they may be turned out of the pots, with all the earth about their roots, ſo as not to receive any check by the tranſplanting. This may be the more eaſily done, as only one melon plant ſhould be ſuffered to grow in each light, and there will not be any danger of hurting their roots when they are removed in this way. When they are well placed on the top of the little mounts, or hillocks, before mentioned, they ſhould be watered gently, and this ſhould be repeated once or twice, till they have taken good root, after which more water will ſeldom be wanted, or adviſable; becauſe too much wet makes them canker at the root, and then they never produce good fruit. When the plants are well fixed in this new bed, a greater quantity of earth ſhould be laid on it, beginning at the hillocks, that their roots may be enabled to ſtrike out horizontally; and as this earth is added from time to time, it ſhould be preſſed or trodden down as cloſe as poſſible, till it is at laſt raiſed at leaſt a foot and an half thick upon the dung all over the bed. The frames ſhould alſo bo raiſed in proportion, that their glaſſes may not be ſo near the plants, as to make the ſun ſcorch them: but in this raiſing of the frames, great care muſt be taken to ſtop every crevice all around, ſo that no cold air may be able to penetrate through them.

The earth which the Dutch and German gardeners, who are very exact in that reſpect, lay upon theſe beds, conſiſts of one third of hazel loam, one third of the ſcouring of ponds or ditches, and one third of very rotten dung. They prepare this compoſt at leaſt one year, but oftener two years, before they uſe it; frequently turning it during that time, the more thoroughly to blend and ſweeten it: but Mr. Miller has found, by experience, that melons ſucceed beſt in this country when they are planted in two thirds of freſh gentle loam, and one third of rotten neats dung, well mixed and frequently turned over during one year before they are wanted, ſo as to enable them to enjoy all the benefit of a winter's froſt and ſummer's heat; and of this a ſufficient heap ſhould always be kept in readineſs, under a ſhed, well ſheltered from heavy rains, which would carry off it's goodneſs.

When the plants have four leaves, and conſequently a joint, their tops above that joint ſhould be pinched off with the finger and thumb, to make them put out lateral branches, for theſe are to produce the fruit; and when there are two or three of theſe branches, their extremities muſt alſo be pinched off as ſoon as they have got two or three joints, to force out more; and theſe again muſt be treated in the ſame manner, that there may be runners enough, as the gardeners call them, to cover the bed. Care muſt be taken not to bruiſe the plants when the tips of their ſhoots are thus pinched off, nor muſt they be cut with a knife, becauſe the wound will not heal ſoon in either of theſe caſes. Neither ſhould a greater number of lateral ſhoots than is neceſſary to cover the bed properly, be forced out by cropping off their ends, leſt more fruit ſhould be produced than the plant can poſſibly nouriſh. The farther management of theſe plants is the ſame as that of cucumbers, to which I therefore refer, to avoid repetitions: only it is to be obſerved, that melons require a greater ſhare of air than cucumbers, and very little water; and that when they are watered, it ſhould always be at a diſtance from their ſtems.

If the plants raiſed in frames ſucceed well, their vines will extend over the bed, and reach to the frames, in about ſix weeks, at the end of which the alleys between the beds ſhould be dug up, or if there is but one bed, a trench about four feet wide ſhould be dug on each ſide of it, as deep as the bottom of the bed. A ſufficient quantity of hot dung ſhould then be trodden down cloſely to it, till this dung is as high as that of the bed, and this additional breadth ſhould be covered with the ſame ſort of earth as was uſed for the bed. This earth ſhould alſo be trodden down as cloſe as poſſible, and the whole bed ſhould by theſe means be enlarged to the breadth of twelve feet; for the roots of the plants will extend themſelves to very near that diſtance: but if they ſhould reach farther than they are covered, and their extremities be conſequently dried by the ſun and air, the plants themſelves will gradually languiſh and decay, or at beſt produce but meagre, mealy, and ill flavoured fruit; whereas thoſe which have a ſufficient breadth and depth of well trodden earth for their roots to run in, will remain in vigour till the froſt deſtroys them. Mr. Miller has experienced the benefit of this practice ſo far as to have a ſecond crop, even of Cantaleupe melons, upon the ſame vines as had borne the firſt; and that ſecond crop has ſometimes ripened very well under his judicious inſpection. The languiſhing of the plants, for want of ſufficient room to extend their roots, frequently before the fruit is full grown, and even ſometimes before it is well formed, may ſoon be diſcovered by the drooping of their leaves in the middle of the day, and a then ſpeedy total decay of many of thoſe leaves. It is owing to their not having enlarged the beds as above directed, or even made them at all wider than they were at firſt, or increaſed the original depth of the mould upon them, which perhaps did not exceed the common allowance of about three inches, that many people have ſeen their plants of Cantaleupe melons pine away, and periſh, before they had ripened a ſingle fruit; and then have imputed to their tenderneſs, too great, ſay they, for this climate, a miſcarriage which was entirely owing to their not underſtanding the right method of cultivating them.

When the vines have extended ſo far as to fill the frames, and conſequently to want more room, the frames ſhould be raiſed up about three inches above the ſurface of the bed, and ſet upon a few bricks, at that height, in order that the ſhoots may have room to run out under them: for if the plants are vigorous, theſe branches will reach to the diſtance of ſix or ſeven feet every way from their ſtem. It therefore is evidently beſt not to put more than one plant under each light; and the more ſo as it's fruit will ſeldom ſet well if the vines are crowded, but will drop off when about the bigneſs of an egg. The addition of the warm dung before mentioned, on each ſide of the bed, will indeed, by reviving the heat of the dung in the bed, be of great ſervice to the ſetting of the fruit, eſpecially if the ſeaſon ſhould prove cold, as it ſometimes is with us till the very end of May; and this is ſurely no ſmall advantage accruing from that method. To ſecond it properly, the frames for melons ſhould not be made ſo ſmall as is the general cuſtom; for the wider they are, the better the plants will thrive, and the greater quantity of fruit they will produce.

If the weather ſhould become cold after the plants have extended themſelves from under the frames, it will be right to cover the extremities of their vines every night with mats, during the continuance of the cold; for if they are injured, the growth of the fruit will be retarded, and the plants themſelves may be hurt eſſentially. Care ſhould alſo be taken after this enlargement of the beds, that what water is given to the plants be poured only in the alleys between the beds, or towards the outſide of the ſpace added to them; for their roots will now have extended ſo far as to reap the benefit of any ſuch watering, and their ſtems will continue the ſounder for being kept dry.

This watering ſhould be pretty plentiful when it is given; but it ſhould not be repeated above once a week even in the drieſt weather: and on the other hand, the plants ſhould be aired as much as poſſible when the ſeaſon is warm.

The plants of melons intended to be reared under bell or hand-glaſſes, ſhould be raiſed in the ſame manner as the before mentioned; and the beds, or ridges, for them ſhould be made by the latter end of April, if the ſeaſon is forward. A ſufficient quantity of hot dung ſhould therefore be provided for this purpoſe, ſo as to allow eight or nine good wheelbarrow loads of it to each glaſs. When there is but one bed, and that is to be extended in length, the trench for it ſhould be dug four feet wide, and it's length ſhould be proportioned to the intended number of glaſſes, which ſhould ſtand at leaſt four feet aſunder: for if the plants are too cloſe to each other, their vines will intermix and entangle, and crowd the bed ſo as to prevent the ſetting of the fruit. This trench ſhould be ſo ſituated, that there may be room for widening the bed two or three feet on each ſide. It's depth muſt depend on the nature of the ſoil, as was before obſerved: but if the ground is ſo dry as to obviate all danger of the bed's being hurt by wet, it cannot well be dug too deep. After the dung is ſpread, trodden down, and flatted in the trench, as already directed, a hill of earth (ſuch as was before adviſed will be the beſt) ſhould be raiſed eighteen inches high, with a flat head in the middle of each ſpot where a plant is to be ſet; but the reſt of the bed need not yet be covered above four inches thick; for that will be ſufficient to prevent the evaporation of the warmth of the dung. The glaſſes ſhould then be ſet down cloſe, over the hills, that theſe may be warmed ſo as to be fit to receive the plants, which they will be in two or three days, if the bed works kindly, and then the plants ſhould be ſet in the top of the hills, in the manner before directed. If they are taken out of pots, with all the earth about their roots, only one ſhould be ſet under each glaſs, becauſe there will not then be any danger of their growing; but if they are tranſplanted directly from the ſeedling bed, it will be right to plant two upon each hill, and afterwards to remove one of them, if they both grow.

Theſe plants muſt be watered when they are firſt ſet, to bring the earth the cloſer to their roots. They muſt alſo be ſhaded every day, till they have taken new root; and if the nights prove cold, the glaſſes ſhould be covered with mats, the better to preſerve the warmth of the bed.

When ſeveral of theſe beds are made, they ſhould ſtand eight feet aſunder at firſt, that there may be between them a proper ſpace, which is afterwards to be filled up, in order to enlarge them ſo that the roots of the vines may have room to extend themſelves every way, for the reaſons before aſſigned.

When theſe plants have taken good root, their tops muſt be pinched off as before directed for thoſe in the frames; and the glaſſes ſhould be raiſed up in the day time, in warm weather, on the ſide oppoſite to the wind, to let in freſh air to the plants, which will otherwiſe be drawn up weak and ſickly: a ſtate which all poſſible care ſhould be taken to prevent, becauſe their runners cannot ſupply the fruit with due nouriſhment, if they themſelves have not proper ſtrength.

If the weather be favourable, the glaſſes ſhould be raiſed two or three inches high from the ſurface of the beds, and ſet upon three bricks, as ſoon as the plants are grown long enough to touch their ſides, in order to give the vines room to run out from under them; but it is eſſential to obſerve, that, when this is done, the whole bed ſhould be covered with earth to the depth of eighteen inches; that this earth ſhould be trodden down as cloſe as poſſible; and that, if the nights ſhould prove froſty, a covering of mats ſhould be carefully ſpread over the beds, to guard the tender ſhoots of the plants from the cold. It is alſo to be obſerved, with regard to the Cantaleupe melon in particular, that, as the vines of this ſort cannot endure wet, the beds where it grows ſhould be arched over with hoops, to ſupport the mats, and that theſe ſhould be held in readineſs to be uſed at a moment's warning, either againſt cold or rain: for this is the only way to have theſe melons ſucceed in ſo variable a climate as our's is. Mr. Miller gives a ſtriking inſtance of the neceſſity of this precaution, when he ſays[1], that he had ſome beds of Cantaleupe melons in as fine order as could be deſired, under theſe glaſſes, and that they were totally deſtroyed by one day's heavy rain in June.

If the weather ſhould prove cold after the bed is covered with the proper thickneſs of earth, well trodden down, it will be adviſable to dig a trench along each ſide of it, or, if there are more beds than one, to dig out their intermediate ſpace, then to fill this, or the trenches, with hot dung, up to the height of the dung of the adjoining bed, and to cover this dung with an equal depth of well trodden down earth, as before directed. This new dung will revive the warmth of the former beds, and ſoon make the plants ſhew their fruit. The watering of them, pinching off their tops, and, in ſhort, every other part of their management, muſt be the ſame as before directed for thoſe under frames: but a farther care requiſite here is to cover them with mats in all hard rains and cold nights. If all this is rightly performed, theſe plants will remain vigorous until the cold in autumn deſtroys them,

The oiled paper coverings are a late invention; but they have been found to ſucceed admirably well when rightly managed. The chief thing to be attended to when they are uſed, is, not to keep them down too cloſe over the plants; for then the melon vines will waſte themſelves by running out in length, and will be ſo weak as rarely to ſet their fruit in any plenty. The beſt way therefore is, where theſe coverings are intended to be uſed, to raiſe the plants under bell or hand glaſſes, as before directed, till they are grown large enough to be releaſed from thoſe glaſſes; and then, inſtead of mats, to uſe this oiled paper covering, which, if it be prudently managed, will anſwer every end that can be deſired.

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[1] *Gardener's Dict.* Art. Melo.

To make this covering, a number of ſheets of ſtrong, but not too dark coloured, paper ſhould be paſted together ſo as to over ſpread the frame intended to be uſed; and theſe ſhould then be faſtened to the frame, and rubbed well over with linſeed oil, which will dry ſoon; for all the ſtench ſhould be gone off before it is put over the plants, becauſe they will otherwiſe be hurt thereby. Pan-tile laths put together in the ſhape of the ridge of a houſe, with hinges to each ſlope, whereby any of the pannels may be raiſed at pleaſure, to let air in to the plants, are the beſt materials, and the beſt form, for theſe frames; for when they are made with broad hoops, like the tilts of waggons, they are cumberſome to move, and no air can be admitted to the plants, but by raiſing up one whole ſide of the frame; which is very inconvenient.

When the vines begin to put forth their fruit, which they will do in plenty ſoon after the bearing runners ſhall have been produced by nipping off, in the manner before adviſed, firſt the top of the plant, as ſoon as it has one joint, and then the ends of the earlieſt lateral ſhoots when they have two or three joints, they ſhould be carefully looked over thrice a week, to obſerve the ſetting of the young melons, and ſingle out, upon each runner, that only which ſeems to be the ſtrongeſt fruit, which has the thickeſt foot-ſtalk, and which is ſituated neareſt to the ſtem. All the others ſhould then be pinched off; and the end of the runner upon which a melon has been thus choſen ſhould alſo then be nipped off at the third joint above the ſelected fruit, to ſtop the ſap and ſet the melon: but none of the ends of theſe bearing runners ſhould ever be broken off before the particular fruit has been culled out, becauſe that would only make them produce more ſhoots, which would weaken the plant, and draw away the nouriſhment neceſſary for the fruit. For this reaſon, if any new ſhoots do break out, or any young fruit appears, after the above precautions in favour of that which is intended to remain have been taken, they ſhould be nipped off immediately; for if many of them are ſuffered to grow, they will abſolutely impoveriſh the plant to ſuch a degree, that it would not be ſurprizing to ſee all the fruit drop off when it comes to be about as big as a man's thumb. One young melon is as much as ought to be left upon any one runner; for, if but half of theſe ſtand, they will be full as many as the plant can nouriſh. Six or eight of the Cantaleupe's, whoſe fleſh is thick, are full enough for the ſtrongeſt plant of that kind; and though ſome ſmaller ſorts may be ripened in greater numbers, even unto fifteen or twenty upon one plant, they will be thinner and poorer than if they were leſs numerous.

For plants which are ſo confined under frames, that the wind requiſite to convey the farina from the male flowers to the female is excluded, it is the practice of ſeveral gardeners, and perhaps it may there be even a neceſſary one, to take off ſome of the male flowers whoſe farina is juſt ripe and fit for the purpoſe, and, inverting them over the female flowers ſituated on the crown of the young fruit, to ſtrike the former gently with the tip of a finger, ſo as to ſhake it's farina into the latter; for by this means the female flower will almoſt ſurely be impregnated, and if it is, it's fruit will ſwell ſoon after, and ſhew manifeſt ſigns of being perfectly ſet: but, from the time that the fruit appears on the vines, the glaſſes ſhould be conſtantly taken off in good weather, or the fruit will ſeldom form in any plenty.

As the melons draw towards ripening, (long before which all the ſuperfluous fruit and weak runners will have been pinched off, if they are properly managed,) they ſhould be turned gently twice a week, that every part of them may receive equal benefit from the ſun and air; for if the ſame ſide is ſuffered to lie continually downward, in which ſituation it will be deprived of both thoſe advantages, that ſide will become pale, or whitiſh, as if it were blanched.

Beſides airing the plants as much as poſſible when the weather will permit, they will alſo require to be watered in very dry weather, and perhaps moſt particularly after they have been pruned: but this, as was before obſerved, ſhould be done with great care not to wet their ſtems, by pouring the water only in the alleys, at a diſtance from them: nor ſhould it be repeated oftener than once in a week or ten days. Then, indeed, the alleys ſhould be well ſoaked, to forward the growth of the fruit, and render it thick fleſhed: though it is eſſentially neceſſary not to over-water the plants.

The goodneſs of all melons depends greatly on their being cut at a proper degree of maturity. The Cantaleupe, in particular, is ſo very nice in this reſpect, that it will loſe much of it's delicacy if it be left but a few hours too long upon the vines. The beds ſhould therefore be looked over at leaſt twice every day when the fruit is ripening; and if thoſe which are intended for the table are cut early in the morning, before the ſun has warmed them, and laid by in a cool place till they are uſed, their flavour will be much better than if they are gathered later in the day, and ſerved up directly. Such as are cut afterwards. when the heat of the day has affected them, ſhould be put into a pail of cold ſpring water, or ice, to cool them, before they are ſet upon the table.

A ſure ſign of maturity in the Cantaleupe melon is, it's beginning to crack at the foot-ſtalk, and to emit a fragrant ſmell. Whenever this happens, the fruit ſhould be cut directly; for this ſort ſeldom changes it's colour as the others do, and only a few hours delay will render it too ripe, as was before obſerved.

The beſt ſeeds of melons are thoſe which are taken from the firmeſt and higheſt flavoured fruit; and if they are ſcooped out with the entire pulp, ſo as not to diſplace them, and left in it for two or three days before they are waſhed out, they will be benefited thereby. None but the heavy ſeeds, which ſink in the water, are worth ſaving.

*Muſhrooms* of the right eatable ſort, which it is of importance to diſtinguiſh well from ſeveral noxious kinds that have been productive of even fatal accidents, appear at firſt with a roundiſh head, not unlike to a button. The outſide of this head is then very white, as is likewiſe the ſtalk on which it grows; but it's under part, when it is taken off that ſtalk, from which it ſeparates pretty eaſily, is of a livid fleſh colour. Its fleſh is alſo very white within. If this ſort remains undiſturbed, its head will ſpread to a conſiderable ſize, and open, at the bottom, ſo as to form an almoſt flat ſurface, the under part of which will then be changed to a dark colour.

Moſt of the writers upon gardening have ſpoken ſo confuſedly, not to ſay, of moſt of them, ſo unintelligibly, of the means of propagating this plant, that, excepting the authors of the *Maiſon Ruſtique*[m], and Mr. P. Miller, one is ſometimes puzzled to gueſs at their meaning. The account which this laſt has given in his dictionary[n], is the moſt practical, being the method of the gardeners near London, who raiſe annually great quantities of muſhrooms for ſale. The ſubſtance of it is to the following effect.

The ſpawn of muſhrooms, from which only they are propagated, looks like a white mouldineſs ſhooting out in long ſtrings. It is frequently found among the dung of old hot beds, or in old dunghills, eſpecially when much litter has been mixed with theſe laſt, or the wet has not penetrated ſo as to rot it; or it may be procured by mixing ſome long ſtable dung, which has not been thrown up in a heap to ferment, with ſtrong earth, and then laying this mixture under cover where it cannot be wet, and where the air may be excluded from it as much as poſſible; for, the more effectually it is kept from air, the ſooner the ſpawn will be produced. It will generally appear in about two months, if the heap has not been laid ſo cloſe together as to heat (for that will deſtroy the ſpawn), and eſpecially if it has been well covered with old thatch, or litter which has lain ſo long abroad as to have loſt the power of fermenting. Theſe are expedients by which the ſpawn of muſhrooms may be procured at almoſt any time, by thoſe who have not already had muſhroom beds in their gardens, and therefore cannot collect it from their remains: for there are but two months of the year in which it can be gathered from downs or paſtures. Theſe are Auguſt and September; when plenty of muſhrooms ſpring up naturally in many of thoſe places. To propagate them from thence, the ground ſhould be opened about their roots, and ſuch earth as is there found full of ſmall white knobs, which are the offsets, or young muſhrooms, ſhould be attentively gathered up, with as much care as can be not to break the lumps, or the earth about them. This ſeed, or rather this ſpawn (for if muſhrooms have ſeeds, they are imperceptible to the eye), ſhould be kept very dry till it is uſed; for the drier it is, the better it will take to the bed, as has been remarkably experienced by Mr. Miller, who declares, that he never ſaw theſe plants produced ſo ſoon, or in ſo great quantity, as from a parcel of their ſpawn which had lain near the oven of a ſtove for upwards of four months, and was become ſo dry, that he deſpaired of it's ſucceſs.

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[m] *Tom.* II. *p.* 110.

[n] Art. MUSHROOMS.

The beds for muſhrooms ſhould be made of dung plentifully intermixed with litter, but not thrown in a heap to ferment. The beſt dung for this purpoſe is that which has lain ſpread abroad for a month, or longer. Their breadth ſhould be about two feet and an half at bottom, their length proportioned to the deſired quantity of muſhrooms, and they ſhould be made on dry ground, by ſpreading upon it, firſt a layer of dung about a foot thick, and upon this about four inches deep of ſtrong earth; then a couch of dung about ten inches thick, and upon that another layer of earth, contracting the ſurface of the bed all the way up, till it terminates like the ridge of a houſe. This may be done with three layers of dung, and as many of earth. When it is finiſhed, it ſhould be covered with litter, or old thatch, as well to prevent it's drying, as to keep out wet, and after it has remained eight or ten days in this ſituation, it will be of a proper temperature to receive the ſpawn, for which it's warmth ſhould be but moderate. The thatch, or litter, ſhould then be taken off, the ſides of the bed ſhould be ſmoothed, and a covering of light rich earth, by no means wet, ſhould be laid all over it, about an inch thick. Upon this the ſpawn ſhould be placed, by laying it's lumps about two or three inches aſunder, in ſuch manner as to prevent their ſlipping down, and then the whole ſhould be covered gently with about half an inch thick of the ſame light earth as was uſed before. The covering of litter ſhould then be re-placed over the bed, ſo thick as to ſecure it from wet, and to prevent it's drying. If theſe beds are made in the ſpring or autumn, when the weather is temperate, the muſhrooms will frequently come up in a month's time: but thoſe which are made in ſummer, when the ſeaſon is hot, or in winter, when it is cold, will not produce them near ſo ſoon. Sometimes too it happens that neither of theſe beds, but moſt particularly thoſe made in the ſummer or winter, yield any muſhrooms before the end of five or ſix months; and that they then produce uncommon quantities, and continue in perfection for a long time.

The great art in managing of theſe beds is, to keep them conſtantly in a due degree of moiſture, and, above all, not to ſuffer them ever to receive too much wet; for that would inevitably deſtroy the ſpawn of the muſhrooms. During the ſummer, they may be uncovered, to admit gentle ſhowers of rain to them at proper times; and if the weather continues dry for a long while together, it will be right to water them gently now and then, but by no means to over-do it. During the winter, they muſt be kept as dry as poſſible, and cloſely covered, leſt the cold air of that ſeaſon ſhould injure them. It will even be right, in froſty or very cold weather, to lay over them a covering of dry litter, for it muſt not incline to ferment, and upon that ſome warm litter ſhaken from out of a heap of dung. This covering ſhould alſo be renewed as often as it is found to decay, and it's thickneſs ſhould be increaſed if the cold grows more ſevere.

The muſhrooms thus produced have a finer flavour than any that are gathered in the fields; and if the above directions are obſerved, they may be had in plenty during the whole year: for each ſingle bed will continue good for ſeveral months, and yield great quantities, if the ſpawn takes kindly.

When theſe beds are deſtroyed, the ſpawn for a freſh ſupply ſhould be taken from them, and laid up in a dry place until the proper ſeaſon for uſing it, which ſhould not be ſooner than five or ſix weeks, in order that it may have time to dry well before it is put into the new bed; for otherwiſe it will be apt not to ſucceed.

*Purſlane* is raiſed upon a hot bed by thoſe who would have it among their early ſallets; for it is too tender a plant to be ſown in the open air before the month of April, and even then it muſt be placed in a warm ſituation: but it is of ſo very cold a nature, that it cannot be ſafely eaten in this country, except in the heat of ſummer, during which a ſupply may be eaſily had by ſowing it upon common beds of light rich earth, at three or four different times, about a fortnight or three weeks diſtant from each other. I ſay, by ſowing it *upon* theſe beds, becauſe it's ſeeds, which are very ſmall, ſhould be ſprinkled extremely thin over the ground, and then only patted down gently with the back of a ſhovel, ſo as juſt to prevent their being blown away. The plants, which will riſe in a few days, will require no other culture than keeping them free from weeds, and watering them two or three times a week in dry weather; for purſlane delights in ſomewhat more than ordinary moiſture. In about ſix weeks after ſowing, they will be fit for uſe.

The green leaved, and the red or yellow leaved, commonly called golden purſlane, are but varieties of the broad leaved, or garden purſlane, which is the only ſpecies cultivated in our kitchen gardens.

The ſeeds of purſlane are ſaved from ſome of the earlieſt and fineſt plants, which are left for this purpoſe, whilſt all the weak or ſmall leaved ones about them are rooted out. When they are ripe, the ſtalks which bear them ſhould be cut down, ſpread upon cloths, and dried in the ſun during three or four days; houſing them each night. They ſhould then be beaten out, ſifted, cleaned, and laid up in a dry place. Some are of opinion, that the ſeeds of purſlane are beſt when they are about three years old; but that ſeems to be a miſtake.

## *Some general Cautions proper to be obſerved in regard to the Kitchen Garden.*

THE beſt ſeaſons for bringing garden ground into good order, either by trenching it, or by giving it a thorough digging, are the autumn and the ſpring. The former ſhould be performed pretty early in November, for the next ſpring ſowings; and that which is to be ſown in the autumn, ſhould be dug in May; in order that the winter's froſt and ſnow in the former caſe, and the ſummer's heat in the latter, may the more effectually mellow and looſen the ſoil, and kill the weeds. For this laſt purpoſe, in particular, the weather cannot be too hot, nor the earth too dry.

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A compoſt of earth and well rotted dung ſhould be kept always ready, in a remote corner, under ſuch ſhelter as will preſerve it from heavy rains and other inclemencies of the weather; to be uſed when occaſion may require, for earthing up of ſome plants, ſifting over ſome of the ſmalleſt ſorts of ſeeds, laying upon hot beds, or other ſimilar purpoſes. The remains of old hot beds are excellent for this uſe; and therefore they ſhould be laid by carefully.

The beds in which the plants are ſown, or ſet, ſhould not be wider than one can reach half way acroſs, in order to weed them, rake them, and keep them in due order. Narrow foot-paths, at leaſt, ſhould therefore be left between them, wherever they occupy any conſiderable part of the garden.

It is beſt to ſow, or plant, in a dry light ground in autumn, and in a moiſt ſoil in the ſpring of the year.

A pleaſing, and perhaps uſeful, regularity will be preſerved in the garden, by ſetting, ſo far as can be conveniently done, all the durable plants in one quarter, the ſalleting in another, the aſparagus in a third, and ſo on. If the garden is large, it will be a means of ſaving ſome time, and trouble, to thoſe who are to gather them.

Particular care ſhould be taken to have a conſtant and regular ſucceſſion of crops; and to order them ſo that no part of the ground may ever remain long unoccupied.

Moſt herbs of the eſculent kind grow the ſtronger, take the better root, yield the fairer leaf, grow the ſweeter both in ſmell and taſte, endure the winter better, and are in ſome meaſure prevented from becoming ſticky, or running to ſeed, by a moderate plucking or cutting off, of the tops of their ſhoots and branches. Their maturity is accelerated by early ſowing, or planting, in warm expoſures, or by the means of hot beds, as before directed; and it is retarded by frequent tranſplantation, becauſe their roots cannot, in this laſt caſe, put forth new fibres, to collect their nouriſhment, till ſeveral days after their removal.

The ſeeds of plants, in general, ſhould not be watered till they have lain forty eight hours in the ground, by which time the earth will be ſettled about them, and they will have imbibed ſome of it's moiſture: for much water, before that, coming upon them at once, will be apt to make them burſt. They ſhould be ſown deepeſt when the ground is drieſt: but an almoſt univerſal rule, is to proportion the depth of the ſowing to the ſize of the ſeed.

It is better to water a plant ſeldom and thoroughly, than often and ſlenderly; becauſe a ſuperficial watering ſerves only to make it root ſhallower than it would otherwiſe do, and thereby renders it the more liable to be affected by the weather. But, at the ſame time, care ſhould be taken not to pour the water on too haſtily, or in too great quantity, for fear of chilling the plant, or perhaps rotting it's root, and of waſhing away the fineſt, and therefore moſt nutritive, particles of the earth.

All plants ſhould be watered carefully when they are firſt removed; and moſt of them will require it alſo in extremely dry ſeaſons, unleſs they are cultivated according to the principles of the new huſbandry: but care ſhould be taken not to wet the leaves of any that are young and tender, and to water only the earth about them, whilſt the weather is cold. Even thoſe plants which are of a more hardy kind, or their ſeeds newly ſown, ſhould not be watered but in the forenoon, ſo long as the nights are cold. When theſe are warm, and the days hot, the evening is the moſt proper time for watering them.

All ſeeds ſhould be gathered in dry weather, when there is not any moiſture upon them; and the beſt way to preſerve them is, to hang them up in bags, in a dry room, where vermin cannot come at them. The temperature of this place ſhould be moderate; leſt either too much warmth, or a too ſtrong current of air, ſhould make them dry, and conſequently decay, ſooner than they would otherwiſe do: and at the ſame time care muſt be taken not to exclude the air totally from them; it having been repeatedly experienced, that ſeeds kept long in bottles cloſely ſtopped have entirely loſt the power of growing. They will keep longeſt in their pods, when they can be ſo laid up, becauſe thoſe coverings not only defend them from the injuries of the outward air, but, ſo long as they are not disjoined from them, continue to ſupply them with a degree of nouriſhment which helps to maintain them in a plump ſtate, fit for vegetation. The ſeeds of all ſoft fruits, ſuch as cucumbers, melons, &c. are of courſe excepted from this general rule; for they muſt be well cleanſed from their ſurrounding pulp, the rotting of which would otherwiſe ſoon corrupt them. Thoſe of melons in particular, are ſo far benefited by being kept in a warmer ſtate than would ſuit any others, that the plants produced from them are thereby rendered the leſs luxuriant, and therefore more fruitful: for which reaſon it is that many people carry them in an inner pocket of their breeches for ſix weeks or two months before they ſow them, in order to exhale part of their moiſture; and in effect, this will weaken them as much as two years keeping them in the common way.

Thoſe ſeeds which ſwim upon the ſurface of water, when they are put to that trial of their goodneſs, ſhould be rejected for ſowing; becauſe, as hath already been frequently obſerved, though many of them will grow, they never produce ſo good plants, or ſo fine fruit, as the fuller, plumper, and more perfect ones; which ſink to the bottom.

The age at which it is beſt to ſow the ſeeds of the plants before treated of, and the time to which they will keep good, are thus aſcertained by Mr. Miller[o] after many years experience and very accurate obſervation.

The ſeeds of aſparagus, baſil, beans, beet, borage, capſicum, carrots, celeri, chervil, creſſes, endive, fennel, finocchia, hyſſop, kidney beans, lavender, leeks, lentils, marjoram, marigolds, onions, parſley, parſneps, peas, purſlain, radiſhes, ſavory, ſkirrets, ſpinage, thyme, and turneps, are beſt ſown the firſt ſpring after they have been ſaved; and indeed many of them will not grow if they are kept longer.

Thoſe of cabbages, colliflowers, endive, lavender, lettuce, muſtard, and ſorrel, will not be the worſe for keeping two years, if they are well preſerved; though all of theſe are equally good for uſe the firſt year.

The ſeeds of cabbages, cucumbers, lettuces, melons, and ſavoys, will grow very well at the end of three years, if they have been properly ſaved and kept. Some of them, and particularly thoſe of cucumbers and melons, are generally reckoned beſt when they are three years old; becauſe, when they are new, the plants produced by them will grow too vigorous, and yield but a ſmall quantity of fruit. However, none of theſe ſeeds ſhould be kept longer than four or five years, though they will grow at the end of nine or ten: but then their plants will be weak, and their fruit ſmall.

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[o] *Gardener's Dict.* Art. SEED.

The ſeeds of fennel will frequently remain in the earth a whole year, eſpecially if they are ſown in the ſpring; ſo that whenever the plants do not come up the firſt year, the ground ſhould be left undiſturbed till the following ſpring, except only keeping it clear from weeds, and the plants will then appear.

## SECT. II.

### OF THE FRUIT GARDEN.

THE uſeful and the agreeable concur to recommend this branch of cultivation by ſo much the more ſtrongly, as the plants which appertain to it, being perennials, require only occaſional care, little trouble, and hardly any expence.

In my diviſion of this ſubject, I ſhall begin with ſhewing how the beſt ſtocks for fruit trees are to be raiſed in the Seminary and Nurſery: I ſhall then point out the moſt approved methods of preparing them to yield their reſpective fruits in the greateſt perfection, by means of grafting, budding, &c. Their management when planted againſt walls, in Eſpaliers, and when reared as Standards, will be ſpoken of next; and I ſhall cloſe this Section with an account of ſuch fruit-bearing Shrubs as merit the attention of a good huſbandman. The Orchard will, of courſe, claim the enſuing Section, and the then next place will be be due to the Vine, now an object of great importance to our colonies. This will naturally lead me to the making and managing of Wine, Cyder, Perry, Beer, and ſuch other liquors as are rendered wholſome and palatable by means of fermentation.

## *ARTICLE* I.

### *Of the Seminary and Nurſery for Fruit-Trees.*

THE perſon who has a Seminary and Nurſery of his own enjoys the advantage of not being obliged to buy, at every turn, the trees which may be wanted to repair the loſs of thoſe that fail, periſh, or become worn out, in his garden, orchard, or other plantations: he is much ſurer of the ſorts and qualities of thoſe which he ſets, than he could poſſibly be if they were purchaſed from even the moſt careful nurſery-men who raiſe them for ſale; becauſe moſt of theſe, having dealings with each other, procure from their friends what they have not themſelves, and therefore cannot be entirely relied on in theſe matters, how great ſoever their probity may be in other reſpects; and, which is a circumſtance of no ſmall additional importance, his plants are already accuſtomed to the ſoil and ſituation in which they are to grow.

This ſpot ſhould be ſituated conveniently for water, and at no great diſtance from the dwelling houſe, in order that the maſter, whoſe frequent inſpection is abſolutely neceſſary, if he expects it to proſper, may the more eaſily viſit it at all times of the year. It's expoſure ſhould be to the ſouth or ſouth-eaſt; and beſides being well ſheltered by diſtant trees, to break all ſtrong winds, particularly from the north and weſt; it ſhould be ſo carefully incloſed, that no cattle, or vermin, may be able to get in; for they would make ſad havock among the young trees, eſpecially in winter, when the ground is often covered with ſuch depth of ſnow, that they cannot readily come at graſs.

Hares and rabbits muſt be guarded againſt with the utmoſt caution; for they are great deſtroyers of young trees in that ſeaſon, by gnawing off their bark. The ſoil ſhould be of a middling nature, neither too wet, nor over dry; though, of the two extremes, dry is to be preferred, becauſe, if trees do not grow ſo faſt there as they do in moiſt ground, they are generally ſounder and more diſpoſed to fruitfulneſs: neither ſhould it be in any reſpect better than that into which the trees are to be tranſplanted to remain: it ſhould be fitted thereto; and the degree of warmth ſhould alſo be the ſame, as nearly as poſſible. It is chiefly for want of obſerving theſe laſt precautions, that the trees raiſed in the rich dunged nurſeries near London, and ſent from thence into the country, perhaps to the northern parts of England, where they are planted in a poorer ſoil and colder ſituation, are frequently at a ſtand, or make but very little progreſs, for three or four years after their being removed.

The ground ſhould be well trenched to the depth of eighteen inches, or rather two feet, if the ſtaple will admit of it, in Auguſt or September; and if it be ſuffered to lie rough all the winter, it will be greatly benefited thereby. In this trenching, it ſhould be thoroughly cleared from all large ſtones, which would otherwiſe fret and gall the roots of the young trees; and from weeds, particularly ſuch as couch graſs, docks, &c. leſt they ſhould entangle with thoſe roots, ſo as not to be extirpated afterwards, and over-run the ground, to the prejudice of the plants intended to be reared; for they ſhould be kept as clear as poſſible from weeds during the whole time of their growth. Another good digging in the ſpring will prepare it to receive ſuch ſeeds as are to be ſown then; and a digging or two more, in the enſuing ſummer, will fit it perfectly for thoſe that are to be planted in the next autumn. Juſt before either of thoſe ſowings or plantings, it muſt be levelled and raked as even as poſſible, and laid out in beds, with paths between them, proportioned to their reſpectively intended uſes. As many of theſe as may be requiſite ſhould be allotted for the Seminary, at one end of this ſpot, and the reſt ſhould be reſerved for the Nurſery. The beds ſhould be about a yard wide, and the intermediate ſpaces ſufficient for a perſon to go conveniently between them, in order to ſow, ſet, and weed the plants.

All ſtocks for fruit trees ſhould be raiſed from the kernels or ſtones of the fruit; for ſuckers (though ſome people uſe them), beſides being hardly ever well rooted, are very apt to produce quantities of other ſuckers, which weaken the trees exceedingly, and become very troubleſome in the borders and walks of a garden. The beſt way therefore is to ſow a few ſtones and kernels annually, or at leaſt every other year, for a conſtant ſupply. Both theſe ſorts of ſeeds are beſt when their fruit has been ſuffered to hang upon the tree till it drops through ripeneſs, and is afterwards permitted to begin to rot: but they muſt be carefully taken out before that rottenneſs can affect them. They ſhould then be well cleared from the pulp, and the largeſt, plumpeſt, and heavieſt ſhould be ſelected, and carefully laid up in dry ſand, in a place where neither vermin nor moiſture can come to them; for the latter would ſpoil their growth by rendering them mouldy, and the former, particularly rats and mice, are ſo very fond of the kernels of apples and pears, that they will even ſcratch them up after they are ſown, and then devour them. Traps ſhould therefore be ſet in the Seminary, to catch thoſe miſchievous animals.

Layers, ſlips, and cuttings, when they have taken good root, make far better ſtocks for grafting on, than any ſuckers; but ſtill they are much inferior to thoſe which are raiſed from ſeeds.

The beſt ſtocks for each ſort of fruit are the following:

For *Apples*, which muſt always be grafted upon a free ſtock, that is to ſay, upon a ſtock of their own kind, for they will not take upon that of any other fruit, the ſorts moſt generally uſed are, 1. The Crab ſtock, as it is commonly termed: 2. The Dutch Creeper; 3. The Paradiſe ſtock; and 4. The Codlin ſtock.

The firſt of theſe, called likewiſe free ſtocks, are uſually raiſed from the kernels of all ſorts of apples taken indiſcriminately from the cyder preſs; and as all the trees of this ſpecies are, without diſtinction, termed crabs before they are grafted, theſe are called by the general name of crab ſtocks: but the beſt, particularly for ſuch apple trees as are intended for ſtandards, are raiſed from the kernels of real wildings, or crabs, which have been preſſed for verjuice; for theſe are always cleaner, freer from canker, more durable, and leſs luxuriant in their growth, than any that are raiſed from the kernels of finer and ſweeter apples. They alſo produce the firmeſt, moſt juicy, and beſt taſted fruit, as well as the fitteſt for keeping, and will preſerve the ſorts grafted upon them in their true ſize, colour and flavour, far better than any of the other ſorts of free ſtocks. Theſe laſt will, indeed, produce larger fruit; but it will not be ſo well taſted, or keep near ſo long. For winter apples in particular, the true crab ſtock is incomparably the beſt. In ſhort, it is remarkably with this, as it is with all other fruits, that, the ſourer the ſtock is, the better it's fruit will be.

The ſecond ſort of ſtocks for apples, called the Dutch paradiſe apple, Dutch ſtock, or Dutch creeper, is generally preferred for eſpaliers, or dwarfs, becauſe it is eaſily kept within the compaſs uſually allotted to thoſe trees, without ſtinting the graft too much; nor does it decay, or canker, near ſo ſoon as the third ſort, commonly called the dwarf paradiſe apple, which is now raiſed only for very ſmall gardens, or for the curioſity of ſetting an apple tree upon the table with it's fruit upon it, which never is at all numerous.

Codlin ſtocks are uſed by ſome, in order to ſtint the growth of their grafts; but as they never produce firm or laſting fruit, they ſhould be abſolutely rejected, at leaſt for all winter apples, and eſpecially if they have been propagated by ſuckers, as is the common way. Even the Codlin tree itſelf is ſo much improved by being grafted upon a crab ſtock, that it becomes much more durable than it would otherwiſe be, ceaſes to put out ſuckers, and produces firmer and tarter flavoured fruit, which is alſo much fitter to keep.

November and December are proper times for ſowing the kernels of apples in dry ground; but where the ſoil is wet, it is beſt to wait till February. The moſt regular and moſt convenient way of ſowing them, in order to facilitate the taking up of the plants, is to drop them, but not too cloſe together, in little channels opened acroſs the bed, (which it is taken for granted, has been well dug, raked, and properly prepared as before directed), and then to cover them with about half an inch deep of the ſame mould. The plants will come up in the ſpring, when they muſt be carefully weeded; and if the ſeaſon ſhould prove dry, it will be right to water them twice or thrice a week. The weeding of them muſt be continued during the whole ſummer, leſt they ſhould be choaked, or ſtinted in their growth; and if they thrive well, they will be fit to tranſplant into the nurſery the next October; at which time the ground that is to receive them, ſhould be dug again thoroughly, and carefully cleared from all weeds.

The beſt ſtocks for all ſorts of firm winter *Pears* are raiſed from the kernels of the fruit of which Perry has been made, or from the ſeeds of ſome of the ſtrongeſt and quickeſt growing ſummer pears, ſuch as the Lady's thigh, and the Windſor. Theſe kernels, if ſaved as before directed for apples, and afterwards ſown, in the ſame manner, early in the ſpring, will come up in about ſix weeks; and if the plants thus produced are kept clear from weeds, they will be ſtrong enough to remove from the ſeed bed into the nurſery in the enſuing month of October. But for all ſorts of ſoft melting pears, which are in general the ſummer and autumn fruits, quince ſtocks are preferred, eſpecially for a ſtrong ſoil, or for ſuch trees as are deſigned for dwarfs or walls; becauſe the luxuriancy of their growth is checked by theſe ſtocks, and their ſhoots are more eaſily kept within due compaſs, than they can be when grafted upon free ſtocks. They muſt not, however, be uſed indifferently for all ſorts of pears; firſt, becauſe there are ſome which will not thrive upon them, but will decay in two or three years, or at moſt but juſt keep alive; and ſecondly, moſt of the ſorts of hard, or winter pears, are rendered ſtony by being grafted on a quince ſtock: beſides which it is to be obſerved, that no ſort of pear will do upon quince ſtocks in very dry and gravelly ground. Theſe ſtocks are often propagated from ſuckers, which may be obtained in great quantities, by cutting down an old quince tree:. but, for the reaſons before aſſigned, they are not near ſo good as thoſe which are raiſed from well rooted layers or cuttings.

The white thorn was formerly uſed as a ſtock to graſt pears on; but it is now almoſt totally laid aſide for that purpoſe, becauſe it never keeps pace in it's growth with the fruit grafted or budded upon it; and alſo becauſe the fruit which it produces is generally dryer, and more apt to be ſtony, than that which grows upon pear ſtocks.

*Cherries* do beſt when grafted upon ſtocks raiſed from the ſtones of the common black, or wild red cherry, both of which are ſtrong growers, produce clean ſtocks, and are more laſting than any of the garden kinds. Theſe ſtones, collected from the ripeſt and almoſt rotten fruit, may be ſown in the autumn in a bed of light eatth; or they may be kept in ſand till the ſpring, and be ſown then. The plants produced by them muſt be kept carefully clear from weeds, and watered from time to time in dry weather, as before directed. They ſhould remain in the ſeed bed till the ſecond autumn after ſowing, and will then be fit to tranſplant into the nurſery, in October. Stocks of the Corniſh, and of the Morello cherry, likewiſe raiſed from the ſtones, have alſo been uſed with ſucceſs, to render the trees more fruitful and leſs luxuriant in their growth; for in theſe laſt reſpects they have nearly the ſame effect upon cherries, as the paradiſe ſtock has upon apples.

*Plums* will not do upon any but Plum ſtocks, the beſt of which are raiſed from ſtones of the freeſt growing ſorts, ſuch as the muſcle, the white pear-plum, &c. Theſe ſtones ſhould be ſet in autumn, about three inches deep and four inches aſunder, in a bed of light dry earth, which it will be right to cover in the winter with a little dry ſtraw, or haulm, to protect them from the froſt; for that would deſtroy them, if it were to penetrate deep into the ground. Their plants will come up the next ſpring, when the covering of litter ſhould be carefully removed; and if they are watered ſparingly now and then in the ſpring and ſummer, and kept conſtantly clear from weeds, they will be fit to remove from the Seminary into the Nurſery in the then enſuing ſpring, or, which is more eligible, in the following autumn.

All the late, or autumn *Peaches*, which are the hard ſorts, and all *Nectarines* and *Apricots*, ſucceed beſt upon ſtocks of the muſcle, or of the white pear-plum, raiſed from the ſtone: though any of the large growing plums, whether white or red, will afford very good ſtocks for theſe fruits. Some recommend almond and apricot ſtocks for the early, or ſummer peaches (commonly diſtinguiſhed by the appellation of melting peaches), which will not grow upon plum ſtocks: but the almond ſtocks are ſo tender in their roots, ſo apt to ſhoot too early in the ſpring, and of ſo ſhort duration, that the preference is deſervedly given, for theſe kinds, to the apricot ſtock, upon which they will take perfectly well, without being near ſo ſubject to blight, as upon the almond. Theſe ſtocks are raiſed, and managed, in the ſame manner as thoſe of the plum. They are particularly proper for all ſorts of Peaches which are planted in a dry ſoil; becauſe the peach ſeldom does well in ſuch ground, if it be grafted on any other ſtock; but the Apricot will thrive there exceedingly. For this reaſon, the common practice of the nurſery gardeners is, to bud the plum ſtocks either with apricots, or ſome free growing peach, and after theſe have grown a year, they bud the tender ſorts of peaches upon their ſhoots; by which means many ſorts ſucceed well, which would ſcarcely keep alive in the common way. The gardeners term theſe double-worked Peaches.

The ſtones of Peaches are not worth ſetting for ſtocks to inoculate, unleſs it ſhould be for almonds;

becauſe the plants which they produce are of a ſpungy nature, and will neither laſt, nor bear tranſplanting. They may, indeed, produce ſome new ſorts of peaches, if they are neither budded nor grafted (for all the varieties of fruits have been originally obtained from their ſeeds); and theſe may be better ſuited to our climate, than ſuch as are brought from warmer countries: but ſo few fruits raiſed in this manner prove better than thoſe from which the ſeeds were taken, that they ſeldom make amends for the trouble of rearing them. However, if any, who have ground to ſpare, chooſe to try the experiment, I will ſuppoſe with peaches, their beſt way is to plant the ſtones of thoſe ſorts only which ripen pretty early, which have a rich vinous juice, whoſe fleſh is firm and cleaves to the ſtone, and of which the fruit has been ſuffered to remain upon the tree till it has dropped off, through ripeneſs. If a ſuperior ſort chances to be thus obtained, it may be eaſily multiplied afterwards by budding it upon proper ſtocks; for budding, or inoculating, is the beſt way of propagating all ſtone fruits.

When the plants raiſed in the Seminary are fit for tranſplanting into the Nurſery (the moſt proper time for which is the month of October in the next enſuing autumn after their being ſown), the earth about them ſhould be carefully raiſed with a ſpade, in order to preſerve their roots as entire as poſſible. The very ſmall fibres of thoſe roots ſhould then be pruned off, and if any of them have a tendency to ſhoot downright, they ſhould be ſhortened, in order to make them ſtrike out horizontally. A line ſhould then be drawn acroſs the ground intended to be planted (the ſpot having been previouſly well dug and looſened), and an exactly ſtrait trench being opened with a ſpade, the plants ſhould be ſet therein as upright as poſſible;

after which the trench ſhould be filled up, and the earth trodden gently down to their roots, with as much care as can be not to diſplace their ſtems ſo as to render the row crooked. If they are deſigned for dwarfs, the diſtance of a foot from plant to plant in the rows, and of three feet from row to row, will be ſufficient; but if they are intended for ſtandards, the rows ſhould be at leaſt three feet and an half or four feet aſunder, and the plants ſhould not be nearer to each other than a foot and an half in the rows. By allowing theſe ſpaces in the nurſery, the wood of the ſtocks will be better ripened, and rendered more compact, than that of thoſe which grow cloſe together, and are thereby drawn up to a greater height. The wood of theſe laſt will be ſoft, and ſo very porous, that the cions grafted into them will ſhoot too vigorouſly to be able to produce much, or good fruit; and when trees have acquired an ill habit at firſt, it is very difficult to reclaim them afterwards. In this tranſplanting into the nurſery, none of the ſtocks ſhould be headed, or pruned at the top, becauſe that would weaken them, and force out lateral branches which would ſpoil them.

If the winter ſhould prove very cold, it will be proper to ſpread ſome dry ſtraw, or haulm, upon the ſurface of the ground, near the roots of the plants, for a ſafeguard to their tender fibres, which would otherwiſe be in danger of being hurt by the froſt: but care ſhould be taken not to lay it too thick about their ſtems, or to let it remain there too long, leſt it ſhould deprive the plants of the moiſture neceſſary for their growth. It ſhould therefore be taken away as ſoon as the froſts are over.

In the ſummer, all weeds ſhould be hoed up, and deſtroyed, as faſt as they appear; and the ground ſhould be dug between the rows at leaſt every ſpring, or rather twice a year, *viz.* in October and March, the more effectually to looſen it ſo that the roots of the plants may eaſily ſtrike out their fibres on every ſide. Care ſhould alſo be taken to rear the ſtocks as ſmooth and as upright as poſſible, by rubbing off their ſide buds as ſoon as they are obſerved, or pruning off ſuch ſhoots of that kind as may have eſcaped the notice of the gardener at their firſt coming out.

If the ſtocks grow well, ſuch of them as are intended for dwarfs will be fit to graft or bud after they have ſtood two years in the Nurſery: but thoſe which are deſigned for ſtandards will not be tall enough until the fourth year; for theſe ſhould be budded or grafted near ſix feet from the ground, or elſe the graft will not advance much in height; nor is it poſſible to make a good ſtandard from a low grafted ſtock, unleſs the graft be trained upward.

## *ARTICLE* II.

### *Of Grafting, and of Inoculating, or Budding of Fruit Trees.*

AFTER a few general directions relative to this branch of gardening, by which alone there can be a certainty of having the exact kinds of fruits which are deſired; I ſhall explain, as clearly and as conciſely as I can, the moſt approved methods of performing the buſineſs, firſt of Grafting, in all it's different ways, and then of inoculating, or Budding.

The reaſon for grafting, or inoculating, is, that as all good fruits have been accidently obtained from ſeeds, ſo theſe, when ſown, will often degenerate, and produce ſuch fruit as is not worth cultivating: but when the ſhoots, cions, or grafts, as they are called, are taken from ſuch trees as yield good fruit, theſe will never vary from their kind, whatever be the ſtock, or tree, on which they are grafted.

Theſe cions, or grafts, ſhould always be ſhoots of the former year, for older ones never ſucceed well. They ſhould be taken from the beſt bearing branches of the healthieſt and moſt fruitful trees, rather old than young, and whoſe wood is moſt compact. The ſhorteſt jointed, moſt ſtumpy, and fulleſt of buds, make the beſt grafts; and thoſe which are cut from lateral or horizontal branches ſhould be preferred to ſuch as are taken from ſtrong perpendicular ſhoots. Care muſt be taken not to cut them from a ſickly tree, becauſe they will long retain, and ſometimes never get the better of, any diſtemper derived from their mother-plant: nor ſhould they be taken from a young luxuriant tree, whoſe veſſels are generally large; becauſe they alſo will, in that caſe, continue to produce luxuriant ſhoots, which ſeldom afford much fruit. The length of the graft, or rather the number of buds left upon it, ſhould, in a great meaſure, be regulated by the more or leſs thriving ſtate of the ſtock, which will accordingly be able to yield more or leſs ſap to nouriſh it: but, generally, three or four buds are ſufficient for any graft, and two of them are enough in moſt caſes.

Theſe grafts, or cions, ſhould be cut off from the trees juſt before their buds begin to ſwell, which is generally three weeks or a month before the ſeaſon for grafting. They ſhould then be laid in the ground with their cut end downward, ſo as to bury them half their length; and their tops, which muſt not be ſhortened till the grafts are uſed, ſhould be covered with dry litter, to prevent their being withered by the air: though M. Worlidge ſays [p] that many excellent grafters had aſſured him, that the graft which ſeemed withered, and fit to be thrown away, has proved the beſt when tried; and that a graft a little withered and thirſty, is the better received of the ſtock. Certain it is, that a graft which has been cut ſome time before it is uſed, and kept in a due ſtate of moiſture, by being ſtuck into the ground, or into clay, will take better than one that is grafted as ſoon as it is cut. If a ſmall joint of the former year's wood is cut off with the cion, this laſt will be the better preſerved; and that joint of old wood may be pared away at the time of grafting the cion, which is to be reduced to a proper length, or number of buds, before it is inſerted in the ſtock †. If the cions are to be carried to a conſiderable diſtance before they are grafted, their cut ends ſhould be put into a lump of moiſt clay, or ſtuck into a turnep, and the whole of them ſhould be wrapt up in moſs. By this means they will keep freſh for a month, or longer. But it is to be obſerved, that ſuch as are to be carried far ſhould be cut in proportion earlier from the trees, than thoſe which are to be grafted upon, or near, the place of their growth. Mr. Mortimer had Pear-grafts from Paris, which grew perfectly well [q]. If they are any thing dry when received, they may be eaſily recovered, by laying them in water a few hours, and afterwards ſticking them in moiſt earth.

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[p] *Syſtema Agriculturæ*, c. 7. §. 5.

† Mr. Mortimer mentions his having been told, that a cion grafted with the top on, will bear ſooner than if the top be cut off: but he does not ſay this as of his own experience, and the generality of writers upon gardening ſeem to recommend the contrary. *Art of Huſbandry*, *Vol.* II. *c.* 3.

[q] *Art of Huſbandry*, *Vol.* II. *c.* 3.

In the choice of ſtocks from the nurſery, for grafting upon, the preference ſhould always be given to thoſe which have been raiſed from the ſeed, as before directed, and particularly to ſuch as have been tranſplanted once or twice, and are the ſtraiteſt, ſmootheſt, and healthieſt. The next to theſe, in point of goodneſs, are thoſe which have been raiſed from layers, or cuttings; but, as I have repeatedly ſaid, no ſuckers from the roots of trees ſhould ever be uſed for ſtocks, for the reaſons already aſſigned.

The ſourer, that is to ſay the wilder, the ſtock is, and the higher the cion grafted on it is placed, the better will be the fruit, eſpecially if the graft be from a ſweet kind; and the more ſpace the ſtock has had in the nurſery, the ſounder, and better ripened, and more compact it's wood will be. Alſo, the oftner it has been tranſplanted, in a proper ſeaſon, and with due care to trim it's roots, the ſtronger and more numerous thoſe roots will be, and conſequently the head of the tree more flouriſhing afterwards.

For old trees, already growing in the places where they are to remain, and whoſe fruit it is intended to renew or change, there is no other choice than that of the branches, of which the young, healthy, well ſituated, and ſmooth barked are the beſt to graft on. If theſe trees ſtand againſt walls, or in eſpaliers, it will be proper to graft ſix, eight, or ten branches, according to the ſize of the tree; becauſe they will then be much ſooner furniſhed with new branches, than when a leſs number of cions are put in: but if they are ſtandard trees, four or at moſt ſix cions will be ſufficient.

As a general rule what trees will take and thrive upon each other (an eſſential circumſtance concerning which no clear or ſure directions have yet been given by any of the writers on this ſubject, if we except Mr. Worlidge [r] and Mr. Miller [s]), it is to be obſerved, that all thoſe which are of the ſame genus, that is to ſay, which agree in their flower and fruit, will grow upon each other: for inſtance, all the nut bearing trees may be ſafely grafted on each other; and ſo may all the plum bearing tribes, under which are compriſed not only the ſeveral ſorts of plums, but alſo the almond, peach, nectarine, apricot, &c. which agree exactly in their general characters, whereby they are diſtinguiſhed from all other trees *. But as many of theſe are apt to emit large quantities of gum from ſuch parts of their wood as are deeply cut or wounded; ſo the tender trees of this kind, *viz.* peaches, nectarines, apricots, and cherries, which are moſt ſubject to this accident, are found to ſucceed beſt when they are budded or inoculated. Cherries are, perhaps, the moſt apt of all trees to bleed greatly when they are cut.

The moſt proper ſeaſon for grafting is in the ſpring (*viz.* in February or March, as was before ſaid) juſt before the riſing of the ſap, or, at leaſt, before it riſes in any quantity: but the weather muſt not be froſty, or wet, nor ſhould very high or bleak winds reign when this work is done. Hereon, and upon the exact joining of the inner bark of the cion, with the inner bark of the ſtock, ſo that the ſap which runs between the bark and the wood may be communicated from the one to the other, eſpecially towards the bottom of the cion, depends chiefly the ſucceſs of grafting.

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[r] *Syſtema Agriculturæ, c.* 7. §. 4.

[s] *Gardener's Dict.* Art. GRAFTING.

* By the ſame rule, as Mr. Miller obſerves, all ſuch trees as bear cones will do well upon each other, though they may differ in one being ever-green, and the other ſhedding it's leaves in winter; as is ſeen in the cedar of Lebanus, and the Larch tree, which are found to ſucceed upon each other very well: but theſe muſt be grafted by approach, for they abound with a great quantity of reſin, which is apt to evaporate from the graft, if ſeparated from the tree before it is joined with the ſtock, whereby they are often deſtroyed; and ſo muſt alſo the laurel on the cherry, or the cherry on the laurel. All the maſt-bearing trees will likewiſe take upon each other, and thoſe which have a tender ſoft wood will do well if grafted in the common way; but thoſe that are of a more firm contexture, and ſlow of growth, ſhould be grafted by approach. *Gardener's Dict.* Art. GRAFTING.

Another circumſtance particularly recommended by Mr. Worlidge and Mr. Mortimer, and well worth attending to on this occaſion, eſpecially in grounds that are not perfectly well ſheltered, is, to graft the cions on the ſouth-weſt ſide of the ſtock; becauſe, as the moſt boiſterous wind in ſummer comes from that quarter, it will, in this caſe, blow to the ſtock, and not from it; whereby the graft will be beſt enabled to bear it's force. For this reaſon alſo, and to prevent it's drawing too much, the graft ſhould not be above four or five inches high above the ſtock. To prevent the entrance of wet into the cleft of the young grafted ſtock, all the cut part muſt be kept well covered with clay, or cement, till the bark is grown over it. If theſe precautions are ſtrictly obſerved, the operation will ſeldom fail, ſuppoſing it to be rightly performed, and at a proper ſeaſon, unleſs the weather ſhould afterwards prove extremely bad. February is reckoned the moſt eligible time for grafting the early fruits, ſuch as cherries, pears, and plums; and March the moſt proper for apples: but, unleſs the weather be tolerably mild and open, and quite dry, it is beſt to ſtay till there is a kind of certainty of the froſts being over, even though that ſhould not be till the middle of April, in a backward ſpring.

For inoculating, the beſt time is when the ſap is at the higheſt, that is to ſay, from about midſummer, to the end of July; becauſe the rind is then moſt eaſily ſeparated from the wood.

If any of the ſtocks that were budded in the ſummer fail, they may be budded again in the following ſpring; and if this re-budding, which may be repeated as often as is thought proper, in the ſmootheſt part of the ſtock, ſtill continues to miſs, they may be cut down below the budding, and then be grafted.

The implements neceſſary for grafting are, a fine ſmall hand ſaw, to cut off the heads of large ſtocks; a good ſtrong knife with a thick back, to make clefts in the ſtocks; a ſharp pen knife to cut the grafts; a grafting chiſſel and a ſmall mallet, to pare away the wood; baſs ſtrings, or woollen yarn, to tie the grafts with; and a quantity of clay, or cement, properly prepared, to lay over the inciſions, in order to prevent their bleeding, and to keep out the air.

The method of preparing the clay intended for this purpoſe is, to mix thoroughly together a quantity of ſtrong fat loam, ſome new ſtone-horſe dung broken into ſmall bits, a little tanner's hair, or ſtraw or hay cut very ſmall, with a little ſalt, and as much water as will make the whole of the conſiſtence of pretty ſtiff mortar. The hair, or chopt ſtraw or hay, makes the loam adhere the cloſer together, and the ſalt prevents it's cracking in dry weather. The more this mixture is worked and beaten together, which it ſhould be at leaſt every other day for a month before it is uſed, the better it will be: but care muſt be taken not to let it be expoſed to froſt, or drying winds, whilſt it is preparing.

The cement, or compoſition, which ſome people have uſed of late years, and which they have found to anſwer the deſign of keeping out the air better than the clay before mentioned, is made of turpentine, bees wax, and roſin, melted together. This, when it is of a proper conſiſtence, is laid about a quarter of an inch thick upon the cut part of the ſtock, around the graft; and has this farther advantage over the clay, that there is no danger of it's being hurt by froſt, for cold hardens it, and when the heat of ſummer comes on, by which time it is no longer wanted on the tree, it will melt, and fall off of it's own accord *.

The following ways of grafting are the principal, and moſt approved.

*CLEFT-GRAFTING*, called alſo *Stock*, or *Slit-grafting*. This is uſed chiefly for middle ſized ſtocks, from one to two inches in diameter. The ſeaſon for it is in the Months of February and March; and the method, as now practiſed, is thus.

The head of the ſtock being ſawn, or cut off, with a ſlope, ſmooth and clean; a perpendicular cleft is made therein, about two inches deep, with a ſtrong knife, or chiſſel, from the top of the ſlope, as near to the pith as may be without touching it. In this cleft, the grafting chiſſel, or a wedge, is put to keep it open. The graft, or cion, is prepared by cutting it aſlope, in form of a wedge, to ſuit the cleft; only leaving a ſmall ſhoulder on each ſide: and, when cut, it is to be placed exactly in the cleft, ſo as that the inner bark of the cion may aptly, and cloſely, join to the inner part of the bark, or rind of the ſtock; in the dextrous performance of which, the chief part of the art of grafting conſiſts. That ſide of the cion, which is to be placed outward, at the part where it is cut wedge-wiſe and inſerted into the cleft of the ſtock, ſhould be much thicker than the other ſide, the better to facilitate the exact joining of it's rind to that of the ſtock; for if theſe two do not unite, the graft will not ſucceed. The rind of the ſtock choſen for this way of grafting ſhould therefore not be too thick; becauſe it will then be the leſs manageable. If the cleft pinch too tight, a ſmall wedge may be left in it to bear the ſtreſs. As ſoon as the graft is properly fixed, the cleft ſhould be cloſely covered over with clay, or, which ſome think better, with moſs, or the freſh bark of a tree bound on with ozier.

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* The wax ordinarily uſed for grafting, is a compoſt of one pound and an half of pitch, a quarter of a pound of bees wax, and an ounce of oil of almonds, melted and mixed together; with the addition, in ſpring or autumn, of a moderate quantity of turpentine. CHAMBERS, *Cyclopædia*.

The country gardeners who uſe only clay, lay over it a piece of linnen cloth, to keep it moiſt; and to prevent it's cracking with the heat of the ſun, they tie moſs over that. *Id. ibid.*

Mr. Mortimer recommends tempered clay, or ſoft wax, for cleft-grafting, whip-grafting, and grafting by approach; but clay and horſe-dung for rind-grafting. *Art of Huſbandry*, *Vol.* II. *Book* XIV. *c.* 2.

When this method, which is the moſt ancient [t], and moſt common manner of grafting, is uſed to ſtocks that are not ſtrong, a ligature of baſs ſhould be made around the ſtock, to prevent the opening of it's ſlit; and the whole ſhould then be clayed over, or covered with the cement before deſcribed, to hinder the air from penetrating into the ſlit, ſo as to deſtroy the graft, only two eyes of which ſhould here be left above the clay, for ſhooting.

The ſtraiteſt and ſmootheſt part of the ſtock ſhould always be preferred for grafting, in whatever way this operation is performed; and alſo for budding.

*Grafting in the Rind*, or *Shoulder grafting*, likewiſe called *ſlicing* and *packing*, to diſtinguiſh it from *Grafting in the Bark*, which will next be ſpoken of, is performed in the following manner, about the latter end of March, or the beginning of April, on more ſlender ſtocks than thoſe which are commonly uſed for cleft-grafting.

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[t] See VIRGIL. *Georg. Lib.* II. *v.* 78.

The top of the ſtock is cut off in a ſmooth, ſtrait place: then the cion, or graft is prepared by cutting it on one ſide from the joint, or ſeam, down ſlope-wiſe, making the ſlope about an inch, or an inch and an half long; and obſerving it's bent, ſo that the cion may ſtand nearly upright when it is fixed to the ſtock. At the top of the ſlope, a ſhoulder is made, whereby it is to reſt on the crown of the ſtock. The whole ſlope muſt be plain and ſmooth, that it may lie even to the ſide of the ſtock. The length of the cion uſed here may be about four inches from the ſhoulder, for a ſtandard tree; but for a dwarf, or wall-tree, it may be ſix inches. When the cion is prepared, the outſide of it's ſloped end, from the ſhoulder downward, is applied to the weſt, or ſouth-weſt ſide of the ſtock, and it's length and breadth meaſured thereon; which done, the bark of the ſtock (but not any of it's wood) is cut away to thoſe dimenſions, that the cut part of the cion may be fitted in as exactly as poſſible. In doing this, regard muſt be had to the bigneſs of the ſtock, and the thickneſs of it's bark, in order to proportion thereto the length and breadth of the cut part of the cion; otherwiſe the paſſages of the ſap in the ſtock and cion will not meet, and the cion will then, of courſe, periſh. When the cut part of the cion is exactly fitted to, and laid on that of the ſtock, they are bound together with woollen yarn, and covered with clay an inch above, and as far below, the head of the ſtock; working it round the cion, till it become ſharp at top, that the rain may run down it.

This method has ſeveral advantages over the former. Among theſe are, that the wound heals up ſooner, and that, in the mean time, it is in leſs danger from the weather; that it does leſs injury to the ſtocks and grafts, by avoiding all ſevere ſplittings and pinchings; that the bark is more eaſily placed in the paſſage of the ſap here, than in the cleft; that the graft thrives and ſhoots with greater vigour, and bears ſooner, in this way than in that; and that it is practicable on ſmaller ſtocks than the other, which muſt have a good body, and conſiſtence, before they can bear cleaving.

*Grafting in the Bark* is performed thus. Prepare the ſtock and cion as for grafting in the rind, both as to time and manner; but, inſtead of cutting out the bark of the ſtock, ſlit it down, on the ſouth-weſt ſide, from the top, almoſt as long as the ſloped part of the cion, and at the top of the ſlit looſen the bark, with the point of your knife. Then thruſt an inſtrument, made of very hard wood, ivory, ſilver, or the like, and formed at the end like the ſlope-end of the cion, but much leſs, down, between the bark and wood, to make room for the cion; which being put in, the bark is to be ſo managed, as that it may cloſe exactly to the ſtock and edges of the cion, and the whole is then to be bound up, and covered as before.

*Whip-grafting*, or *Tongue-grafting*, is proper for ſmall ſtocks, from an inch diameter to a quarter of an inch, or even leſs. Mr. Worlidge, Mr. London, Mr. Miller, and others, ſpeak of it as the moſt effectual way of any, and that which is moſt in uſe, becauſe the cion covers the ſtock much ſooner in this method, than in any other: for here the cion and the ſtock muſt always be of the ſame thickneſs. There are three ways of performing it, and all of them may be practiſed ſomewhat later than either of the foregoing.

The firſt is, to ſlope the cion off a full inch, or more; then to do the ſame to the ſtock; and afterwards to tie the one to the other, with baſs or yarn, ſo as to join them cloſely at every part, but particularly at the rind; and then to cover the joint carefully with well tempered clay. The baſs uſed for this, or for any other binding, ſhould be taken from a ſound mat, and be ſoaked in water for ſome hours, to increaſe it's ſtrength and render it the more pliable.

The ſecond way is, to make a ſhoulder in the graft, and, the head of the ſtock being cut off and ſmoothed, to join it as in grafting in the rind.

The third method, which is an improvement of the laſt, is properly named *tipping* or *tonguing*. This is done, by cutting the ſtock off ſlanting, as before, and leaving at it's upper ſide a thin piece, or tongue, as it is called, of the wood, pared away like the lower end of a cion. The cion is then ſloped, and tongued, in the ſame manner as the ſtock, and a ſlit is made in each of them, downward in the ſtock, and upward in the graft, on the ſide oppoſite to the tongue, ſo that each may receive the tongue of the other. The cion is then joined to the ſtock, as cloſely as can be, particularly at the bark; a ligature is made round them with baſs or woollen yarn, and the engrafted part is well covered with clay or cement.

*Side-grafting*. In this, the cion is prepared as in whip-grafting; but the head of the ſtock is not cut off at the time of performing the operation. Inſtead of that, ſo much of the bark as the cion will cover is pared off from the weſt-ſide of the ſtock; then both the cion and the ſtock are ſlit in the laſt mentioned manner of whip-grafting, and they are bound together, and cloſed up with clay. At the year's end, the top of the ſtock is cut off at the grafted place, ſlopewiſe; and the wound is covered with clay or cement.

*Scutcheon grafting* is another method of grafting in the rind, by ſlitting the bark of the ſtock in form of the capital letter T, looſening it with the point of a knife, and inſerting a cion prepared as above. This is practiſed in June, July, and Auguſt; eſpecially if the bark does not part eaſily from the ſtock; and in caſe of failure, it is properly ſupplied by cleft-grafting, in the enſuing month of February or March.

*Crown-grafting* is only practiſed in the larger trees, which are capable of receiving a number of grafts, and are too big to be cloven. For theſe, the head or main branches, being cut off horizontally, four or more grafts are placed round the ſtock, between the bark and the rind, ſomewhat in the manner of a crown. The moſt proper time for performing this is about the latter end of March, or the beginning of April. After the intended number of cions are inſerted, which is done exactly in the ſame manner as that already delivered for grafting in the rind, the whole crown of the ſtock is well clayed over, and only two eyes of each cion are left uncovered; that being ſufficient for their ſhooting.

This method of grafting was more practiſed formerly than it is at preſent; many people having been diſcouraged by the ill ſucceſs that has frequently attended their cions, which have been blown out of the ſtock, by ſtrong winds, after they had made large ſhoots, and even after they had grown there five or ſix years. But this accident may be prevented, by tying the cions to ſtakes faſtened to the tree, till they are ſo firmly fixed, as to have almoſt covered the ſtock.

*Root-grafting* is a modern invention, the deſign of which is ſomewhat different from that of any of the former methods; this being for the propagation, or multiplication, of plants already fitted to produce their fruit.

To perform this, take a graft, or ſprig of a young tree, which you intend to propagate, and a ſmall piece of the root of another tree of the ſame kind, or of a like genus, and whip-graft them together: obſerving, that the but-ends of the graft and root be well united, and that the rind of the root join cloſely to that of the graft. Theſe may, afterwards, be planted out at pleaſure, and the piece of root will collect the nutritive juices, and feed the graft as the ſtock does any other way.

This method of propagation is very eaſy and expeditious; roots being more plentiful than ſtocks: by this means the pieces of roots of one crab-ſtock, for example, or of one apple-ſtock, will ſerve for twenty or thirty apple grafts; and the like of other trees. It is alſo an excellent way for raiſing of tender trees, which will hardly bear being grafted in the ſtock. Add, that trees thus grafted bear ſooner, and are more eaſily dwarfed, than thoſe done the other way.

The only objection againſt this method is, that the young tree grows but ſlowly at firſt, which is occaſioned by the ſmallneſs of the root that feeds the graft; for in all trees the head muſt follow the increaſe of the roots, from whence it hath it's nouriſhment.

*Reiterated grafting*, or *grafting by a double*, or *triple inciſion*, is another method mentioned by Dr. Agricola, whoſe work, though chimerical enough in many reſpects, contains, notwithſtanding, ſeveral good things. To perform this, firſt graft a good cion on a ſtock, and cut it away to one half, or a third part; then fix to that remaining part of the cion, another graft, of a better kind; and to that a third: for the oftener the tree is grafted, the finer fruit it produces; as was before inſtanced by what the gardeners about London call double-worked peaches.

By this method, the author above-mentioned aſſures us, that he produced muſcat pears, which were admirable; making, at firſt, uſe of a ſtock grafted with a pound pear, on which he grafted a ſummer bon-chretien; and when the branch of this laſt had ſhot, he grafted on it a cion of a bergamot, which he alſo cut, and grafted on it a cion of a muſcat pear.

*Grafting of Branches* is alſo commended by Agricola, as a very certain and profitable operation: beſt practiſed on large, full grown, and even old trees.

To do this, half or more of the branches muſt be lopped off, and grafts of three or four years old be applied to them; taking care to have ſtakes, or other things, to ſupport them againſt the wind, &c.

He adds, that by this method, you will have, perhaps the ſame year, or at leaſt the ſecond or third, ſuch a quantity of fruit, as the youngeſt and ſoundeſt tree would ſcarcely produce.

*Grafting by approach*, called alſo *Inarching*, and *Ablactation*, is uſed only when the tree intended to be grafted, and that from which the graft is to be taken, ſtand ſo near, or can be brought ſo near to each other, that they may be joined together. The method of performing it is thus. The branch to be inarched is fitted to that part of the ſtock where it is to be joined; the rind, and part of the wood, of one ſide of that branch, is then pared away, very ſmooth and even for the length of three inches; and afterwards the other branch, which is to ſerve for the ſtock to which the graft is to be united, is ſerved in the ſame manner, ſo that the two may join cloſely and equally together, that the ſap veſſels may meet. A little tongue is then cut upwards in the graft, and a ſlit is made in the ſtock, to receive it; ſo that when they are joined, the tongue prevents their ſlipping, and the graft is the more cloſely united to the ſtock. When they are thus placed exactly together, they muſt be tied with baſs, worſted, or ſome other ſoft thing; and the place of junction muſt be well covered over with grafting clay, to prevent the air from drying the wound, and the wet from rotting the ſtock. A ſtake muſt alſo be fixed in the ground, and both the ſtock and the graft muſt be tied thereto, to prevent their being diſplaced by the wind. When they have remained in this ſtate four months, they will be ſufficiently united, and the graft may then be cut off from the mother tree; obſerving to ſlope it cloſe to the ſtock. It is of great ſervice to the graft then to lay a freſh coat of clay all round the grafted or joined part. This operation ſhould be performed in April or May, that the graft may be perfectly united to the ſtock, before the enſuing winter. It is chiefly practiſed upon oranges, mirtles, jaſmines, firs, pines, and ſome other trees, which do not ſucceed well in the common way of grafting or budding. But, though orange trees are here mentioned among the reſt, this practice is not to be adviſed for them, or for any other trees, if they are intended to grow large; for that they hardly ever do in this method; and accordingly it is ſeldom uſed but for the curioſity of having a young plant with fruit upon it, in a year or two from it's having been raiſed from the ſeed. This is, indeed, effected by inarching a bearing branch into a young ſtock; but the plant ſo treated ſeldom lives long.

The walnut, fig, and mulberry, will alſo take by this method of grafting, though neither of them will ſucceed in any other way: but ſtill, as I have juſt obſerved, they, like all other trees that are thus managed, will remain weak and ſtinted in their growth, beſides the ſhortening of their otherwiſe uſual time of duration.

All grafts, particularly of yonng cions, are ſubject to be injured by birds: but that may be prevented by binding ſome ſmall buſhes about the tops of the ſtocks.

The binding of the grafts, whether it be of baſs or yarn, ſhould be looſened at leaſt, if it be not entirely taken off, at Midſummer, or thereabouts; leſt it's then too great tightneſs (as the ſtock will have increaſed in bulk, and the binding perhaps have been ſwelled, and conſequently ſhrunk, by the weather,) ſhould injure the plant.

*INOCULATING*, or *BUDDING*, is deemed peferable to any of the ways of grafting, for moſt ſorts of fruit trees, but particularly for all ſtone-fruits, ſuch as peaches, nectarines, apricots, cherries, and plums. It is is alſo moſt ſucceſsful for oranges, lemons, and other tender or exotic plants. The reaſons are, that the trees are leſs wounded, and conſequently leſs apt to bleed, in this way, than when they are grafted; and that the buds which are here inſerted into the ſtock when it is fulleſt of ſap, are much leſs liable to fail, than the grafts which are applied to it before the ſap has well begun to riſe, or at leaſt before it has riſen in any great quantity: for it frequently is to the want of a ſufficiency of ſap to feed the graft ſo early in the ſpring as is requiſite, that the gardener has the mortification to ſee his expectation baulked when he uſes that method.

The ſtocks for inoculating are raiſed in the ſame manner as thoſe for grafting; and the age at which they are fit for either is the ſame.

The ſeaſon for this work is, from the middle of June, to the middle of Auguſt, according to the forwardneſs of the ſeaſon, and the nature and condition of the trees intended to be uſed. This laſt may be eaſily known, by trying whether the buds will come well from off the wood: or, which is the moſt general rule, by obſerving when the buds are formed at the extremity of the ſame year's ſhoot; for that is a ſign of their having finiſhed their ſpring growth. The evening of a fair day, in a dry ſeaſon, is the beſt time for inoculating; for if rain falls upon the buds before they have taken, moſt of them will be deſtroyed. The middle of a very hot day is by no means proper; becauſe the ſhoots, or cuttings, from which the buds are to be taken, will then perſpire ſo faſt, as to leave the buds deſtitute of the neceſſary moiſture; eſpecially as they are generally cut from the trees ſome little time before they are uſed. That time ſhould, for this reaſon, be as ſhort as poſſible: but if there be a neceſſity of bringing them from a diſtance, the ſhoots ſhould be wrapped in freſh and moiſt leaves and graſs, to keep them cool; for by that means they may be preſerved two or three days: and if they ſeem to be a little withered when they arrive, let their but ends be ſet for two or three hours in juſt as much water as they can imbibe, and they will ſoon recover, ſo that their buds may be taken off clean and eaſily. But it is very wrong to lay the whole of the ſhoot in water, as ſome do, to revive it, when it appears to be ſomewhat dried; becauſe the buds then become ſo ſaturated with moiſture, that they have no attractive power left to imbibe the ſap of the ſtock, and thereby often miſcarry.

The way which Mr. Miller adviſes[a], to avoid this, when the cuttings are to be brought from a-far, is, to have a tin inſtrument, furniſhed with a ſocket about ten inches long, and a cover to the top, in which muſt be five or ſix holes: as much water ſhould be put into this ſocket, as will fill it about two or three inches high, and the cuttings ſhould be placed therein in an upright poſition, ſo that the part which was cut from the tree may ſtand in the water. The cover is then faſtened down to keep out the air, and the holes in it are ſufficient to let the perſpiration of the ſhoots paſs off, as it ought to do, becauſe it would be very hurtful to them if it were pent in.

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[a] *Gardener's Dict.* INOCULATING.

The buds which are to be inoculated ſhould not be too young or tender, nor yet too old: of the two, young ones are the beſt. They muſt be taken from ſtrong and well grown ſhoots of the ſame year, and from the ſtrongeſt and biggeſt end of thoſe ſhoots.

The manner of inoculating is thus. Being provided with a ſharp penknife, having a flat haft, the uſe of which laſt part is to raiſe the bark of the ſtock to make room for the bud; with a quill cut half way through, and made ſharp and ſmooth at the end, to divide the bud and rind from the ſtock; with woollen yarn, or rather ſlips of ſound baſs mat ſoaked in water; and with proper cuttings of the tree intended to be propagated; chooſe a ſmooth part of the ſtock, about five or ſix inches above the ſurface of the ground if it is to be a dwarf, but at the height of five or ſix feet if it is to be a ſtandard: then make an horizontal cut there acroſs the rind of the ſtock, ſo as not to wound the wood underneath, and from the middle of that cut ſlit the rind downward, gently, about two inches, in the form of a T. Then, cutting off the leaf from the bud, and leaving the footſtalk remaining, make a croſs cut about half an inch below the eye, and a very little above it, and with your knife ſlit off the bud, with part of the wood to it, in form of an eſcutcheon:

cutcheon: this done, ſeparate the bark and bud quickly, and dexterouſly with your quill, or knife, from the ſlip of wood that was taken off with it, ſo as not to leave the root, or eye, of the bud behind; for if that is wanting, the bud will not grow. The bud muſt therefore be examined as ſoon as it is taken off; and if a hole is perceived under it, on the inſide, it ſhould be thrown away, as having loſt it's root, and another muſt be prepared*. When the bud is ready, raiſe the bark of the ſtock where the croſs inciſion was made, with the flat haft of your knife, clear to the wood, and then inſert therein the ſhield or bud, ſlipping it down ſmooth between the rind and the wood of the ſtock, till it's top join to the croſs cut. Any part of the rind belonging to the bud may be cut off, if it be too long, or too broad, for the ſlit made in the ſtock. When the bud is thus exactly fitted to, and placed in, the ſtock, they muſt be bound cloſely round, beginning at the bottom of the ſlit and proceeding upward to it's top, ſo as to miſs only the eye of the bud; for that ſhould not be covered.

Another way of inoculating, which Mr. Worlidge recommends[x] as a ſpeedier and more ſucceſsful method, is to ſlit the rind of the ſtock upwards from the croſs cut, and to ſlip the ſhield, or bud, upward therein; then to cut off the ſuperfluous length, if any there be, of the rind of the bud, when this is in it's proper place, that is to ſay, when it's eye is at, or ſcarcely any thing beyond, the croſſing of the inciſion; then to join the back of the bud to that of the ſtock, and to bind them as before. Or, which is yet more expeditious, and which anſwered well in his practice, to cut the edges of the bark about the bud ſquare, to make a quite croſs inciſion in the bark of the ſtock, to receive the bud ſo cut, and then to bind the whole excepting the very eye of the bud, faſt, as before directed.—It is to be obſerved, that the quicker the operation of inoculating is performed, the better it always ſucceeds.

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* Mr. Miller obſerves, that though the common practice is to diveſt the bud of that part of the wood which was taken with it from the ſhoot; yet, in many ſorts of tender trees, the beſt way is to preſerve a little wood to the bud, the more effectually to prevent it's miſcarrying: for that the not attending to this has made ſeveral people imagine, that ſome kinds of trees cannot be propagated by inoculation; whereas, if they had performed it in this method, they might have ſucceeded, as he hath frequently experienced.

[x] *Syſtema Agriculturæ*, c. 7. §. 7.

Two or three buds may be inoculated on the ſame ſtock: of which ſome, out of curioſity, avail themſelves, in order to have different ſorts of fruit upon the ſame tree.

In about three weeks or a month after the inoculation, the bandage ſhould be taken off; for if it is continued on too long, the ſtock will be pinched thereby; and the bud greatly injured, if not totally deſtroyed. At the ſame time it will be eaſy to ſee which of the buds have taken. Thoſe that have joined to the ſtock will look freſh and plump; and ſuch as have failed will be black and ſhrivelled.

In March following, the ſtock muſt be cut off about three inches above the bud, ſloping it, that wet may not lodge upon it; and the next year it ſhould be cut off cloſe above the bud, that this laſt may cover it, as grafts uſually do. In the mean time, it is very proper to faſten thereto the ſhoot which proceeds from the bud, to prevent all danger of its being blown out.

It is an invariable rule, that no ſucceſs is to be expected in inoculation, if the ſap does not run well; that is, if the bark will not part readily from the wood of the ſtock.

## ARTICLE III.

### Of Tranſplanting of Fruit Trees.

THE ſtocks which have been grafted, or budded, as directed in the foregoing article, will be fit to tranſplant into the places where they are to remain, in the ſpring, or autumn, of the enſuing year. October and November, or as ſoon as the trees have begun to ſhed their leaves, are generally reckoned the moſt proper time for removing them, if they are to be ſet in a middling, or dry, ſoil: but if they are to be planted in moiſt, or wettiſh ground, it is thought moſt adviſable to wait till the next February, or begining of March, that their roots may not be expoſed to the danger of being ſoaked in water during the winter. At all events, they ſhould not exceed two years growth from the graft, when they are tranſplanted, if it be deſired that they ſhould flouriſh with vigour: for the younger and ſmaller a tree is when it is removed, the more likely it will be to thrive and proſper; becauſe it ſuffers leſs injury by the removal, than an older or larger tree. Thus an orchard, for example, of young trees, will ſoon overtake another planted with larger trees ſet at the ſame time; and the young ones will prove by much the moſt durable.

Theſe are the directions generally given, and almoſt univerſally obſerved, in regard to the ſeaſon for removing of fruit trees: but experience has ſhewn, that they may be tranſplanted with great ſafety earlier in the autumn than is commonly practiſed. If this is done when they are ſent from a warmer country to a colder, they will have time to take ſuch root before the winter comes on, that there will be leſs hazard of their being injured by froſt then, than there would be of their being hurt by drought in the ſpring.

Fruit trees have been tranſplanted, to a contiguous ſpot, even when in full ſap, and with their fruit upon them, without any other precaution than leſſening their number of branches, and trimming their roots as uſual when they are taken up; and they have ſucceeded ſo much beyond expectation, that I cannot but recommend the making of farther trials of this practice. Even the fruit upon the trees did not drop off, in one inſtance, in particular, of which I have been very credibly informed.

In digging up the young ſtocks, previouſly prepared for bearing fruit, by grafting or inoculating, as before explained, care muſt be taken not to tear or bruiſe their roots. If they are to be ſent to a diſtance before they are replanted, the earth ſhould be removed from about their roots, and then all their ſmall roots and little fibres ſhould be cut off, as cloſe as can be to the parts from whence theyproceed, leſt the air ſhould corrupt them (which is known by their turning black), and they ſhould grow mouldy, decay, and rot, ſo as to injure the new fibres after they have been ſet again; or even ſo as to diſtemper, or perhaps kill the tree. For the ſame reaſon all bruiſed or broken roots ſhould alſo be pruned off ſmooth. All irregular roots which croſs one another, and all downright roots, muſt likewiſe be cut away: in ſhort, the roots of a tree which is to be ſent far, and conſequently to remain a conſiderable time out of the ground, ſhould be ſo pruned as, in ſome meaſure, to reſemble the fingers of a hand ſtretched open. The larger roots, which are left, ſhould be ſhortened in proportion to the age, ſtrength, and nature of the tree. The tender rooted kinds, for example, ſuch as the walnut and mulberry, ſhould not be pruned ſo cloſe as the more hardy ſorts: and though eight or nine inches may be a ſufficient length for the largeſt roots that are left to apple, pear, cherry, plum, peach, nectarine, and apricot-ſtocks of only one year's growth from their grafting or budding; much more is neceſſary for older trees. In either caſe the roots ſhould extend wider than the head of the tree; and the more ways they ſpread, the better it will be. The tops of the branches of apple and pear ſtocks may be ſhortened a little; but thoſe of ſtone-fruit ſhould not, as yet, be cut at all: neither ſhould any graft be pruned the firſt year, though it ſhoot never ſo ſtrong.

If the ſtocks thus trimmed, and carefully diveſted of their remaining leaves, are covered over with moſs, eſpecially about their roots, and with ſtraw and mats over that, to prevent their being too much dried by the air, or galled in the carriage, they will bear to be kept out of the ground two or three months, provided it be not at their time of vegetating. This is manifeſt by the orange and other trees which are brought to us from Italy, and which ſeldom fail, if they are properly managed, though they have been kept three or four months out of the ground. Care ſhould alſo be had to the proper ſeaſon, when ſtocks are to be ſent to a diſtant place, or to a climate much different from that in which they were raiſed. For example, as Mr. Miller very rightly adviſes [y], if they are to go from a hot country to a cold one, or from a warmer to a colder place, they ſhould be ſent at ſuch time of the ſpring of the year, that, as they come toward the colder parts, the ſeaſon may be warmer, and there may be time to recover them before the enſuing winter, in caſe of their having received any hurt by the way: for thoſe which arrive in the autumn often periſh in the winter, through want of their being able to get root before the cold comes on. By the ſame rule, thoſe which are to go from a cold country to a hot one, ſhould always be ſent in the beginning of winter, or rather ſooner if the diſtance be great, that the cold may prevent their ſhooting before they arrive, and that they may have ſufficient time to take root before the heats come on.—If the roots appear to have been too much dried when they arrive, it will be right to ſet them in water for about eight or ten hours, before they are planted: but only the roots ſhould be immerſed therein.

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[y] *Gardener's Dict.* Art. Planting.

When the ſtocks are to be replanted immediately, they ſhould be taken up with as much earth about them as can be, and it will be neceſſary then only to trim their fibres, to cut off their perpendicular roots, if any ſuch are obſerved, and to ſhorten the ends of their horrizontal ones, becauſe theſe extremities, which are generally very weak, commonly decay after their being moved, and might therefore be apt to communicate a rottenneſs to the reſt, if they were left on. The pruning of their heads depends on the manner of growth for which they are intended. If they are to be ſtandards, the ſtems ſhould be cleared of all ſide twigs, and buds, quite up to it's top: but if they are to be planted againſt walls, or in eſpaliers, they ſhould be ſet with the greateſt part of their heads on, and theſe ſhould remain untouched till the ſpring, when it will be proper to cut their ſhoots down to five or ſix eyes, juſt before they begin to open their buds. Only ſuch irregular ſhoots as croſs each other, ſo as to endanger their being galled and wounded by any ſtrong friction occaſioned by high winds, and the broken or wounded parts, if any have been ſo injured in the taking of them up, ſhould be pruned off at the time of tranſplanting: but none of the main leading ſhoots ſhould be meddled with then, by any means; they being neceſſary to attract the ſap from the roots, and thereby promote the growth of the tree.

Each of theſe methods of planting fruit trees has it's advantages, and is attended with ſome diſadvantages; concerning both of which the following reflections are ſubmitted to the judicious reader.

Standards, growing in open ground, can extend their roots every way, and by that means are more plentifully ſupplied with nouriſhment, than wall trees can be: but as they generally riſe high, it is ſuppoſed, that the ſun has not ſo great a power to exalt the juices and flavour of the fruit, as when the trees are kept nearer to the earth. To obtain this advantage, means are therefore uſed to prevent their running up in height, by making them dwarfs, and planting them in eſpaliers, or againſt walls.

Whoever attends to the whole proceſs of managing dwarfs muſt ſee, that, if I may be allowed the expreſſion, from their cradle to their grave, means are uſed to prevent their arriving at that flouriſhing ſtate which nature intends in all her works. As the perfect condition of the offspring depends chiefly on the health and vigour of the parent; ſo, from trees thus crippled, we muſt expect either a ſcanty, or an impaired fruit. This method is therefore fit only for thoſe who are, perhaps, more curious than wiſe; and to them I leave it.

Eſpaliers anſwer two purpoſes: the firſt is, that of making an uſeful and ornamental boundary to the quarters of a kitchen garden; and the ſecond, the now faſhionable end of preventing the trees from running up in height. I ſhall here conſider chiefly the laſt intention.

It is juſtly ſuppoſed, that the reflection of the rays of the ſun makes the heat much greater near the ſurface of the earth, than at ſome diſtance from it; and it is alledged, that the fruit upon eſpaliers muſt, for this reaſon, be higher flavoured than that which grows on loftier trees, and is, of courſe, in a cooler air. It is likewiſe ſaid, that as eſpaliers are hindered from extending themſelves, a greater quantity of ſap is brought to their remaining branches, than would be if they were ſuffered to run their full length.—But this may admit of ſome doubt; becauſe, as it is well known that all plants which extend themſelves freely above the earth, extend their roots with equal vigour underneath it; ſo it is, from thence, at leaſt problematical, whether by confining the extent of the branches, the roots are not alſo equally confined. I have already had occaſion to ſpeak pretty fully on this ſubject, in treating of grain and other vegetables, in former parts of this work. to which the reader is therefore referred.

An undoubted advantage which eſpaliers have over walls is, that theſe laſt, being built cloſe and compact, repel the winds, and by that means damage the tender plants that lie within the reach of the repulſion: whereas the former deaden the violence of the winds, which, by not dwelling ſo long upon them as they do againſt walls, are conſequently leſs liable to injure the trees, their bloſſoms, or their fruit: beſides which they afford, for the ſame reaſon, a much greater ſafeguard to the plants which they encompaſs in the quarters of the garden.

Where a boundary is wanted in a garden, it is certainly more adviſable to plant fruit bearing trees for that purpoſe, than barren or foreſt trees: but yet, as their growth is ſtinted even in this caſe, I doubt much whether the fruit is ſo perfect, as when the trees can arrive nearer to their full extent. The quantity of it muſt undoubtedly, at the beſt, be leſs.

An indiſpenſable precaution neceſſary to be obſerved is, that no tree which makes ſtrong ſhoots, and delights to grow large, ſhould be planted in an eſpalier. All ſuch will conſtantly run out in large barren ſhoots, which will rob the few fruit bearing branches, and conſequently the fruit on them, of their due nouriſhment. Neither ſhould trees which do not eaſily bear the knife be planted in eſpaliers; becauſe the many wounds which they muſt receive in this method of training them, choak up their juices by the quantity of gum diſcharged at thoſe wounds.

It is a general, and I believe I may ſay an hitherto almoſt unvaried, practice to plant all the finer fruits againſt walls, without ſufficiently inquiring into the motives for ſo doing. To this I muſt obſerve in the firſt place, that the borders under the walls are ſeldom made ſo wide as they ought to be, conſidering that the trees which are planted there can extend their roots but one way: and ſecondly, that due care is not taken to adapt the quality of the ſoil there to the nature of the trees; a precaution which ought to be attended to by thoſe who are curious in their fruit, and which would coſt only the trifling expence of bringing in a ſufficient depth of proper earth.

The chief reaſon aſſigned for planting trees againſt walls is, the additional heat procured by the reflected rays of the ſun, and the warmth communicated to the wall itſelf by the ſun. This, ſay the advocates for this practice, haſtens the ripening of the fruit, and exalts it's flavour, beſides that the ſhelter of the walls protects trees, natives of warmer climates, from our ſevere north and north-eaſt winds.

To this I anſwer, that it is a conſtant obſervation, that all plants brought from a warmer climate to a colder, endeavour to bloom at their uſual ſeaſon, unleſs they are prevented by cold. The conſequence of this is, that if the early part of the ſpring happens to be warm, the bloſſoms of ſuch trees ſwell, and expand themſelves: but as we cannot be exempted from froſt ſo ſoon in the ſeaſon, theſe bloſſoms are nipped in the bud; that is, the firſt froſty night ſtops the circulation in them, and they then neceſſarily die. Nothing ſhews more inconteſtably the ſtoppage of the circulation in trees, than tapping, for inſtance, a birch tree, early in the ſpring: for the warmth, or coldneſs, of the air at that time may be determined by the greater or leſs velocity with which the juice flows, or by the greater or leſs quantity of it, that is diſcharged, almoſt as certainly as by a thermometer. In froſt, the diſcharge ceaſes entirely. It therefore is not at all wonderful, that the circulation is interrupted, by the ſame cauſe, in the finer veſſels of flowers, and that the death of the flower is the neceſſary conſequence. A very ſharp froſt, even after the early fruits are ſet, has the ſame effect on their yet tender veſſels; and the owner is ſurpriſed to find his fruit fall off, in a few days after, without any ſeeming cauſe; unleſs recourſe be had to I know not what peſtilential quality in the eaſt wind, when the ſame effect would follow, did the froſt come from any other quarter. Hence it is evident, that fruit trees would be benefited, rather than hurt, by preventing their too early bloſſoming.

Some gentlemen endeavour to guard againſt this accident, by ſheltering their trees with ſkreens, which have a double effect; that of preſerving them from the warmth of the ſun by day, and that of defending them from the froſt by night *. But if theſe trees were planted as ſtandards, where the air might play freely round them, the motion of the ſap would be leſs forward, and the bloſſoms would conſequently be leſs expoſed to the injuries which happen from their coming out too early. They would likewiſe eſcape another great inconvenience which attends their ſtanding againſt walls; namely, the too great inequality of the heat, as increaſed by the wall, and the coldneſs of the night, againſt which the wall affords no ſhelter, otherwiſe than as it ſkreens the trees from the wind.

Another advantage of ſtandards, and that no ſmall one, is, that their fruit is more likely to eſcape the ravage of thoſe numbers of inſects which harbour and breed in every crevice of a wall, and, imperceptible to our ſlight ſearch, adhere to the branches nailed to the wall. I muſt add to this, that the many, and ſome of them large, wounds which are made in trees, in order to make them ſpread in a certain ſtated form, render them, and eſpecially ſuch as are apt to gum, much ſhorter lived than they would naturally be; which is a very manifeſt diſadvantage, becauſe the older trees are, while they continue ſound, the better and higher flavoured is their fruit. Indeed ſome trees do not bear either in plenty or in perfection, till they have attained their full growth; by which time they are often deſtroyed by the ſometimes

neceſſary

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* Mr. Bradley ſpeaks of a nurſery man, at Brentford, who, having moſt ſorts of fruits in eſpaliers, had portable hedges made of reeds in frames, which he ſet both at the back and front of his eſpaliers, as he ſaw occaſion; and the ſame method has been tried to ſecure the fruit upon wall trees from blighting or too cutting winds: but, Mr. Miller ſays, never with much, if any, ſucceſs.

neceſſary, but more frequently injudicious, uſe of the knife. Now a ſtandard eſcapes that danger.

A farther reaſon which renders walls the leſs neceſſary is, that the fruits planted againſt them ripen before the ſun has acquired it's full force in this climate. This is what happens to all our apricots, to moſt of our nectarines, and to the fineſt of our peaches: for it is well known, that the month of July is our hotteſt ſeaſon, and that the heat of that month will therefore the moſt perfectly exalt the juices and flavour of fruit.

An apricot tree tranſplanted ſome years ago, even into a field, bore fruit, in the very unfavourable ſummer of the year 1763, much higher flavoured than it had ever done againſt a wall, or indeed than any tree againſt the wall had ever borne, in the garden from whence it was tranſplanted; though the field was exactly the ſame ſoil as the garden. The ſame thing happened likewiſe to a green gage.

Walls may be neceſſary for the later peaches: though even a Catherine peach will ripen on a ſtandard, in a favourable ſituation.

But to return to the replanting of fruit trees immediately after their being taken from the nurſery, and the farther management of them in the places where they are to remain.

The directions of profeſſed gardeners, which gentlemen who are very curious in their fruit may follow with advantage, and but little extraordinary expence, are, that peaches, nectarines, apricots, and cherries, ſhould be planted in a freſh hazel loam, taken from the ſurface of a paſture ground, to the depth of about ten inches, with the turf, and prepared by a year's expoſure to the air, and frequent turning of it during that time, to render it mellow. A middling ſoil, neither too wet and heavy, nor over dry, is recommended for plums; and a gentle hazel loam, eaſy to work, and not apt to retain wet, for apples. Pears will thrive in almoſt any ſoil; even in moiſt, hungry, ſtony, and gravelly land, where apple trees will hardly live. However, to render things more ſimple, and eaſy of execution, which is a principal deſign of this work, I muſt obſerve, that a good freſh loamy earth, which is neither too light and dry, nor over ſtrong and moiſt, though rather inclining to be ſtrong than otherwiſe, is the beſt general ſoil, and will do well for almoſt any ſort of fruit.

If the depth of the ſoil in which the trees are to be planted is not naturally ſufficient (for it ſhould be about two feet and an half deep for fruit trees in general); it is better to lay on freſh earth, ſo as to raiſe the border above the level of the reſt of the ground, than to dig out the gravel, chalk, or whatever other hard ſubſtance may lie underneath, and then replace it with other earth; and far better than digging holes, as ſome do, down into the hard ſoil, and filling them with earth to ſet the trees in; without conſidering, that their roots muſt ſoon become confined there, as in a tub, and that the trees will conſequently neither flouriſh well, nor live long.

When theſe borders are made by adding to them earth brought from another place, they ſhould be raiſed at leaſt four or five inches above their intended future level, and that earth ſhould be laid on a month or two before the trees are planted, that it may have time to ſettle thoroughly, and thereby be the leſs liable to ſink afterwards. It is better to give them great breadth (never leſs than ſix or eight feet, eſpecially under a wall) than depth, of earth; becauſe this laſt is apt to entice the roots of the trees downwards, ſo as to endanger their future barrenneſs, by their being out of the reach of the influences of the ſun, rain, and air: for when this happens, they imbibe a great quantity of crude juices, which only add to the luxuriant growth of the trees, and deſtroy their fruitfulneſs: nor are any fruits produced from ſuch trees ever ſo well taſted as thoſe which grow upon trees whoſe roots lie near the ſurface of the ground, and enjoy the kindly benefit of the ſun's heat, to digeſt and correct whatever crudities there may be in the earth.

Another method which may be practiſed, for ſtandards, (becauſe they require a wider and more open ſpace than either wall trees or eſpaliers,) by thoſe who have not the conveniency of bringing on an additional earth where the ground is ſhallow, or lies near gravel, clay, ſtone, chalk, or water, is, to take the top of one half of the ſame land, and lay it upon the other, in ſufficiently wide ridges, abating the intervals like walks, and then to plant the trees in the middle of the ridges. By this means they will have double the quantity of earth to root in, and the walks, or intervals, will preſerve the ridges from too great moiſture. This, upon the authority of Mr. Worlidge,[z] is an experienced and approved remedy in dry ſhallow land, as well as in low wet ground.

It is a general rule, that the ſtiffer and moiſter the ſoil is, the ſhallower all ſorts of trees ſhould be planted therein.

Mild open weather, when the earth is moiſt, the air calm and ſerene, and the wind weſterly, is the beſt for planting. Froſty, rainy, or miſty weather ſhould be avoided for this work, becauſe it moulds and infects the roots of the plants. A hole being made with a ſpade, the tree ſhould be ſet therein about the ſame depth as it was in the nurſery, with it's roots extended in nearly the ſame manner as they were before; the earth ſhould then be broken fine with a ſpade, or by hand, and ſcattered into the hole, ſo as to fall between every root, without leaving any large chaſms between them: but it ſhould not be ſkreened, or ſifted, leſt it ſhould ſettle too cloſe, and become too compact. When the hole is thus filled up, the earth ſhould be preſſed down gently about the ſtem of the tree; but it ſhould not be trodden down too hard, eſpecially in a ſtrong or wet ſoil, becauſe that would cloſe the ground ſo as to obſtruct the paſſage of the tender fibres of the roots, and the tree would be thereby retarded, at leaſt, in it's growth, for perhaps a conſiderable time. The trees thus planted, either for ſtandards or for eſpaliers, ſhould be faſtened to ſtakes driven down by the ſides of them, to prevent their being blown down or diſplaced by the wind: for as to wall-trees, they may, at this time, be ſlightly nailed to the wall, ſo as juſt to keep them in their places.

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[z] *Syſtema Agriculturæ*, c. 7. §. 11.

Mr. Worlidge[a], Mr. Mortimer[b], and moſt other writers on this ſubject adviſe, as a material circumſtance, the replanting of the tree to the ſame aſpect as it had before; that is to ſay, to place, for example, to the ſouth, the ſame ſide of the tree as faced that quarter when it grew in the nurſery: but Mr. Miller declares[c] that, after many trials, he could not obſerve the leaſt difference in the growth of thoſe trees which were ſo placed, and that of others which were reverſed; and that he therefore does not hold it to be of any moment to obſerve this method.

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[a] *Syſtema Agriculturæ, c.* 7. §. 9.

[b] *Art of Huſbandry, Vol.* II. *c.* 2.

[c] *Gardener's Dict.* Art, PLANTING.

Great moderation ſhould be uſed in the watering of all new planted trees; experience having ſhewn, that too much wet rots off the fibres of their roots almoſt as ſoon as they are produced, and that the tree is of courſe ſtopped in it's growth, if not totally killed, as has happened to ſeveral plantations which have been over-watered.—The reverend Dr. Hales placed the roots of a dwarf pear tree in water, and the quantity of moiſture imbibed decreaſed daily, becauſe the ſap veſſels of the roots (like thoſe of ſome boughs which he cut off for the ſame experiment) were ſo ſaturated and clogged with moiſture, by ſtanding in water, that more of it could not be drawn up. Yet this experiment was tried upon a tree full of leaves, and thereby more capable to diſcharge a large quantity of moiſture than ſuch trees as are entirely deſtitute of leaves. It therefore is, as Mr. Miller rightly infers [d], impoſſible that ſuch trees can thrive, where the moiſture is too great about their roots.

If the winter ſhould prove ſevere, it will be proper to cover the ſurface of the ground, over the roots of the new planted trees, with rotten dung, tanner's bark, or ſome other ſimilar ſubſtance, which the gardeners call *mulch*, to prevent the froſt from penetrating ſo as to hurt their young fibres: but this ſhould not be laid on too ſoon, becauſe it would hinder the ſoaking in of the neceſſary moiſture; nor ſhould it, for the ſame reaſon, be left on too long in the ſpring.

The diſtances at which theſe trees ſhould be planted, muſt be proportioned to their ſeveral kinds, and to the ſeveral purpoſes for which they are intended, as will be directed in the enſuing Articles.

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[d] *Gardener's Dictionary*, Art. PLANTING.

*ARTICLE.* IV.

## *ARTICLE* IV.

### *Of the management of Fruit Trees planted againſt Walls.*

HAVING already given ſufficient general directions for the building of walls for fruit trees [f], as well as for preparing the borders under them [g]; and having alſo offered ſome reaſons [h] why I cannot think them of ſuch ſervice to the ripening of fruit as they are commonly ſuppoſed to be, or agree with Mr. Miller when he ſays [i], that "they are abſolutely neceſſary in gardens "for the ripening of all ſuch fruits as are too "delicate to be perfected in this country with- "out ſuch aſſiſtance," becauſe they certainly often counter-act here the very end for which they are intended; little remains but to ſpeak of the method of managing ſuch trees as are planted againſt them.

All the ſtone fruits are accounted peculiarly proper for walls, and ſo are many kinds of Pears. Some of the finer ſorts of theſe laſt may indeed do well enough when ſo planted: but I cannot by any means think the Cherry, for example, a proper tree for a wall, becauſe it will not bear the cutting neceſſary to train it in that manner. The late Pears and Peaches are, in my opinion, the only fruits really fit for this ſort of culture. However, for the ſake of thoſe who chooſe to continue to extend it to other kinds, I ſhall obſerve, that Peach trees, and thoſe of Nectarines, placed againſt walls, ſhould be ſet about twelve feet aſunder: Apricots ſhould be allowed a breadth of ſixteen or eighteen feet; Cherries and Plums, twenty-five feet; and moſt ſorts of vigorous ſhooting Pears, from thirty to forty, according to the goodneſs of the ſoil, and the height of the wall.

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[f] *Page* 15—17. [g] *Page* 19, *and* 236. 237.

[h] *Page* 20, *and* 231—236.

[i] *Gardener's Dict.* Art. WALLS.

The root of the tree taken from the nurſery ſhould be placed in a hole dug about five inches from the wall, and it's head ſhould be inclined thereto, with the bud turned outwards, to conceal the wounded part of the ſtock. The hole ſhould then be filled up, ſo as neither to leave chaſms between the roots, nor to preſs the earth down too hard upon them. Some of the twigs of the young tree ſhould then be faſtened to the wall, to prevent the wind's diſplacing it ſo as to break the tender fibres of it's roots; the ſurface of the ground ſhould be covered with mulch, to keep out the froſt; and in the following ſpring, about the beginning or middle of March, according as the ſeaſon is earlier or later, the head of the tree ſhould be cut down to four or five eyes above the bud, juſt before it begins to ſhoot. In this cutting off the head, the gardener, to avoid as much as poſſible giving any diſturbance to the roots, ſhould ſet his foot down cloſe to the ſtem of the tree, and take faſt hold of the ſtock, below the bud, with one hand, to keep it ſteady, whilſt, with the other, he ſlopes off the upper part gently, with a ſharp knife, at the intended place, which ſhould always be juſt above an eye. This ſhould be done in dry weather; for if much rain ſhould fall ſoon after, and wet get into the wounded part, the tree will be liable to ſuffer conſiderable damage: and for the ſame reaſon, together with it's preventing the cloſing of the wound, froſty weather ſhould alſo be cautiouſly avoided. After the tree has been headed, the earth of the borders ſhould be looſened gently, to render it more fit to admit the fibres of the roots; and if the mulch which was laid on in the autumn be rotten, it may be dug into the border, at ſome diſtance from the roots, with all poſſible care not to diſturb or break them. When the dry weather comes on, a few ſods pared off from a paſture ground, and laid upon the ſurface of the border, about the roots of the trees, with the graſs downward, will preſerve a gentle moiſture in the earth, and be leſs apt to harbour inſects, than any ſort of dung or litter.

The above is the uſual method of tranſplanting trees from the nurſery to a wall. But Mr. Miller is convinced[k], from experience, that, inſtead of taking from the nurſery ſtocks (eſpecially of peaches and nectarines) which have then made one year's ſhoots from the bud, it is better to ſingle out ſuch as were budded the preceding ſummer, and have not made any ſhoot; provided the bud be ſound and plump, and the bark of the ſtock well cloſed at the place of budding; becauſe, when this ſhall have put forth a ſhoot five or ſix inches long, in the following ſpring after being tranſplanted, as it will ſeldom fail to do, that ſhoot may be ſtopped by pinching off it's top, and thereby be made to produce lateral ſhoots, which may be trained to the wall, without having any head to cut off, as muſt be done to thoſe trees which have had one year's growth in the nurſery. The benefit of avoiding this operation is particularly great to ſuch trees as are apt to bleed much, and ſingularly ſo to the moſt tender ſorts. The ſtock of the tree tranſplanted in bud, before it has made any ſhoots, muſt indeed be cut down, likewiſe in the ſpring, to juſt above the bud, becauſe this will rarely ſhoot unleſs that be done; and the nearer it is cut to the bud, the ſooner will the head of the ſtock be covered by the bud: for there is no occaſion to leave on trees which are planted againſt a wall, a part of the ſtock, above the bud, to faſten the ſhoots to, as muſt be done with thoſe in the nurſery; becauſe the ſhoots may here be immediately and properly ſecured, by faſtening them to the wall: nor is this cutting off the ſuperfluous part of the ſtock attended with any danger to the bud, if the wound be but covered with a little grafting wax, or clay, to keep out the wet.

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[k] *Gardener's Dict.* Art. PERSICA.

No time is loſt, but ſome may be gained, by this practice; as the trees which have ſhot before their being tranſplanted muſt be cut down, and there is a hazard of their ſhooting again.

In watering of theſe new planted trees, which ſhould not be done unleſs the ſpring prove very dry, nor then often, or in great quantity, the pot ſhould have it's noſſel on, ſo as to let the water out very gently, almoſt in drops only, as it were; for when it is poured down haſtily, it hardens the ground: and if the head of the tree is watered at the ſame time as it's roots, and likewiſe gently, that refreſhing will be of great ſervice to it.

About the middle of May, the ſhoots of theſe trees, of which there will then often be ſeveral ſix or eight inches long, ſhould be nailed horizontally to the wall. All fore-right ſhoots, and ſuch as are weak, ſhould alſo then be rubbed off, to ſtrengthen thoſe that are left. But if no more than two ſhoots have been produced, and thoſe very ſtrong, the tops of theſe ſhould be nipped off at that time, and this will make each of them put out two or more ſhoots, whereby the wall will be the better furniſhed with branches. It will alſo be right to continue to refreſh them gently with water, from time to time, during the whole ſummer, if that ſeaſon ſhould be very dry, leſt their roots, having but little hold of the ground the firſt year after tranſplanting, ſhould be injured by the drought, ſo as to retard the growth of the tree.

In the beginning of October, when the trees have done ſhooting, it will be time to begin to prune them. In doing this, the branches muſt be ſhortened in proportion to the ſtrength of the tree; that is, if it be ſtrong, they may be left eight inches long; but if weak, they ſhould be ſhortened to four or five. The ſhoots thus cut ſhould then be trained horizontally to the wall, ſo as to leave the middle of the tree void of branches, for that part will be eaſily furniſhed with wood afterwards; whereas, if the ſhoots are trained perpendicularly to the wall, the ſtrongeſt will draw away the greateſt ſhare of the ſap from the roots, run upwards, and leave the ſide branches ſo deſtitute of nouriſhment, as frequently to occaſion their decaying and dying.

In the next ſummer, when the trees begin to ſhoot, they ſhould be carefully looked over again; all fore-right or ill placed buds or ſhoots ſhould be rubbed off, and ſuch as are to remain, for future branches, ſhould be trained up horizontally to the wall, in due order, as they are produced; for this is the principal ſeaſon in which all fruit trees are beſt and moſt effectually modelled to their intended form. Every gentleman who wiſhes his trees to proſper to the utmoſt, and to grow with as much beauty as they are ſuſceptible of, ſhould therefore perſonally look over them at this time, and, with his own hand, rub off their ſuperfluous buds and ſhoots: for if this elegant and eſſentially uſeful part of gardening is left to the hired gardener, it will often be neglected, or ſlovenly performed. Whoſoever omits it, deſerves

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not to have good fruit.—This important buſineſs ſhould not be deferred till Midſummer, as is the common practice, becauſe numbers of uſeleſs ſhoots, which muſt afterwards be cut off, will by that time have robbed the other parts of their due nouriſhment: and beſides, it is by ſtopping ſome of the ſtronger ſhoots (by nipping off their tops) in May, that they are made to put out ſide ſhoots, which, being guided to the vacant parts of the wall, furniſh every part thereof regularly with proper wood. Care muſt, however, be taken not to multiply theſe branches too much, for fear of weakening the tree ſo as to diſable it from producing good fruit; and therefore no ſhoots ſhould be ſtopped in the ſummer, unleſs there be an abſolute neceſſity for new branches in any particular place. Neither ſhould the branches be laid in too cloſe together againſt the wall, becauſe the great numbers of their leaves then exclude the air from their ſhoots, ſo that theſe are never duly ripened, and the fruit which is afterwards produced on them cannot, conſequently, be ſo well taſted as that of trees whoſe ſhoots receive all the advantages of the ſun and air, to bring them to maturity.

In the third year, the branches till then trained horizontally will have acquired ſuch ſtrength, that there will not be much danger in permitting ſome of their ſhoots to go in a more perpendicular direction, in order gradually to give the whole tree the form of a fan, which is by much the moſt beautiful, as well as the beſt way here, becauſe the wall is thereby moſt equally filled with wood.

It is in continuing ſtrictly to obſerve the two foregoing rules, *viz.* to furniſh every part of the tree as equally as poſſible with bearing wood, and not to lay the branches in too cloſe together, that the art of pruning fruit trees in general, and particularly wall trees, chiefly conſiſts. The former of theſe will always be completely effected by pinching off the tops of the young ſhoots, wherever an increaſe of wood is wanted, in May, as above directed. But as ſome have adviſed the doing of this in June, and others even later, I muſt remark here, that if we reflect that young ſhoots made ſo late in the year have not time to acquire a ſufficient ſtrength and ſolidity of fibres to reſiſt the winter's froſt, May will certainly be found to be a much more proper ſeaſon: for whoever caſts an attentive eye over fruit trees after a hard winter, will find many of their ſhoots killed by the preceding froſt; and if he looks ſtill more cloſely, he will ſee, that moſt, if not all, of theſe have been injudiciouſly forced out in a too late ſeaſon *. It is almoſt needleſs to ſay that April, which others again recommend for this work, is too early; becauſe the wounded branch would then be in danger of being deſtroyed by a froſty night.—If theſe directions are judiciouſly followed, it will not be neceſſary to touch any fruit tree with a knife in the ſummer: and that the avoiding of this will be of infinite ſervice to every ſpecies of them, is manifeſt from the many accidents to which they are liable when cut too much at that ſeaſon. All the ſoft, tender, and pithy wooded ſorts, ſuch eſpecially as the peach tree, require a conſiderable time to heal their wounds, when theſe are great, and in the mean while wet and rain eaſily ſoak into the wounded

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* All ſhoots which are produced after the middle of June will be crude and pithy; and though they may ſometimes produce a few bloſſoms, yet theſe rarely bring fruit; nor are the future branches produced from ſuch wood ever ripened, or compact enough to ſecrete, filter, or prepare, the juices in ſo perfect a manner as is requiſite for good fruit.

parts, ſo as frequently to make the branches canker and die.

As to the diſtance at which the branches of fruit trees, or rather the ſhoots of thoſe branches, ſhould be trained againſt a wall; nature gives us a ſure guide, if we but attend to the ſize of the fruit and of the leaves: for it ſhould be ſuch that neither of theſe upon an upper branch may touch the branch underneath.

The winter pruning, as it is called, of fruit trees, is commonly performed in February or March; but the beſt ſeaſon for it is in October, when their leaves begin to fall; for that will be early enough for their wounds to heal before the froſt comes on, ſo that there will be no danger of their being hurt thereby. Thus all the aſcending ſap in the ſpring will be employed to nouriſh only thoſe uſeful parts of the branches which are left; whereas, if they are not pruned till February, the greateſt part of the ſap then in motion in the branches, as may be obſerved by the ſwelling of the buds, will be drawn up in the extreme parts of the branches, to nouriſh bloſſoms which muſt afterwards be cut off: for the extreme buds of ſtrong ſhoots always ſwell ſooner than moſt of the lower ones, and conſtantly draw from thoſe below.

It is the conſtant practice of gardeners, founded upon long experience, to prune weak trees early in the winter, that they may be the leſs endangered by the cutting, and luxuriant trees late in the ſpring, in order to check their luxuriancy. — Mr. Miller accounts for theſe effects in ſo learned a manner, as I muſt confeſs is paſt, I will not ſay *all*, but *my* underſtanding. I therefore reſt ſatisfied with the fact, and refer the curious reader to the article PERSICA in his Gardener's Dictionary.

Thus much for the time of pruning fruit trees in general. The manner of performing it is founded on the following principles:

*Peach* and *Nectarine* trees generally produce their fruit either upon the young wood of the preceding year, or, at moſt, upon ſhoots of two years old, and theſe ceaſe to bear after that age. The branches of theſe trees muſt therefore be ſhortened, according to their ſtrength, in the manner before directed, in order to make them put out annually new ſhoots for the ſucceeding year. When the knife is uſed for pruning them, care ſhould always be taken to cut them a little ſloping behind a wood bud, which may be eaſily diſtinguiſhed from the bloſſom buds; theſe laſt being ſhorter, rounder, and more turgid than the former; for if the ſhoot have not a leading bud where it is cut, it is very apt to die down to the next leading bud. This leading bud, or wood bud, is always neceſſary, to preſerve a circulation of the juices in the branch. The length at which the pruned ſhoots are left, ſhould be proportioned to the ſtrength of the tree: thus, in a healthy ſtrong tree it may be ten inches, or more; but in a weak one, it ſhould not exceed ſix inches: however, this muſt alſo be determined, in ſome meaſure, by the poſition of a fine wood bud; for it is better to leave a ſhoot three or four inches longer, or to cut it two or three inches ſhorter, than one might otherwiſe chooſe to do, for the ſake of ſuch a bud; it being abſolutely neceſſary for the future welfare of the tree. It is alſo neceſſary to cut out entirely, all weak ſhoots, though there may be many bloſſoms upon them; for theſe have not ſtrength enough to nouriſh the fruit, but will weaken the other parts of the tree. It is to the neglecting of this, and to the not diſplacing of all luxuriant ſhoots as ſoon as they are produced, that half the blights we hear complained of are, (tho' wrongly termed, and miſtaken as to the cauſe,) in Mr. Miller's opinion, owing.

In nailing the ſhoots to the wall, care muſt be taken to place them, as near as poſſible, at equal diſtances, in order that their leaves, when come out, may have room to grow, without ſhading the branches too much. So far as the nature of the tree will permit, they ſhould never be nailed upright, becauſe they are very apt to ſhoot from the uppermoſt eyes, and the lower parts of the ſhoots become thereby naked, when they are trained in that manner.

When the fruit is ſet, and grown to the bigneſs of a ſmall nut, it ſhould be looked over, and thinned, ſo as to be left at leaſt five or ſix inches aſunder; for no tree can afford ſufficient nouriſhment to perfect ſo great a crop as it ſometimes produces; and it is evidently better to pull off early ſuch fruits as over-burden it, and therefore are not to remain on the tree, than to let them impoveriſh the reſt by ſtanding longer; eſpecially as, in this laſt caſe, the tree itſelf is frequently ſo weakened thereby, as to be diſabled from bearing well for three or four years after.

If the ſeaſon ſhould prove hot and dry, it will be proper to draw the earth up round the ſtem of each tree, ſo as to form a baſon of about ſix feet diameter, to cover the ſurface of the ground in the baſon with mulch, and once in a week or fortnight, according to the heat and drought of the ſeaſon, to pour down eight or ten gallons of water to the root of the tree: or where there is an engine, which will diſperſe the water in eaſy gentle drops like rain, if the ſame, or a larger, quantity of water is ſprinkled all over the branches of the trees, this ſoaking down to the roots will keep the fruit conſtantly growing, and prevent it's falling off the trees, as it is very apt to do where this method is not practiſed. The fruit thus conſtantly nouriſhed will alſo be much improved in it's taſte, and the trees thus treated will be maintained in vigour. But this watering ſhould not be continued longer than while the fruit is growing; becauſe it will afterwards be hurtful to the trees and fruit; for a dry autumn ripens both wood and fruit better than a moiſt latter ſeaſon.

Mr. Miller, who recommends this practice from his own long and extenſive experience, blames, upon the authority of the ſame unerring guide[s], the too frequent cuſtom of pulling off the leaves of the trees, in order to admit the ſun to the fruit; becauſe, as the leaves are abſolutely neceſſary to cheriſh the bloſſom buds, which are always formed at their foot ſtalks, theſe buds muſt be greatly injured by pulling off the leaves before they have performed the office aſſigned them by nature.

After diſproving the common opinion, that peach trees are not long lived, and that they ſhould therefore be renewed every twenty years, by declaring that he has eaten ſome of the fineſt peaches of various kinds, which grew on trees upwards of fifty years old, and then aſcribing this miſtaken notion to the wrong practice of the French, who generally bud their peaches upon almond ſtocks, which are of ſhort duration; he recommends dunging the borders where fruit trees grow, every other year, with well rotted dung dug into the ground in November, that the rain may waſh down it's fertilizing particles before the ſpring comes on: and to confirm this opinion, he inſtances the practice of the gardeners at Montreuil, near Paris, who have for ſome generations been famous for the culture of peaches, and are as careful to dung the borders where their peach trees grow, every other year, as the kitchen gardeners are for their legumes. He thinks neats or hogs dung, mixed with loam, ſix or eight months before it is uſed, and mellowed by frequent turning during that time, the beſt for a looſe or ſandy ſoil, becauſe this dreſſing is cooler than any that is made with horſe dung; and he thinks this laſt, mixed with light ſandy earth, or ſea coal aſhes, the moſt proper for ſtrong land.

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[s] *Gardener's Dict.* Art. PERSICA.

The chief difference between the management and pruning of peach and nectarine trees, and thoſe of *Apricots*, ariſes from this circumſtance, eaſily attended to, *viz.* that, as Apricot trees produce their fruit not only upon the laſt year's wood, but alſo upon curſons, or ſpurs, which iſſue from the two year's wood; great care muſt be taken not to hurt or diſplace thoſe in the ſummer trimmings, and to ſhorten the branches only in the winter pruning, to make them produce freſh wood wherever it is wanted.

*Cherry* trees will not bear to have their ſhoots ſhortened, for it is at their extremities that they produce many of their fruit buds, and the cutting them off not only leſſens the future crop, but alſo frequently occaſions the death of the whole ſhoot. Their branches, when they are planted againſt a wall, (though I cannot think this a proper method of cultivating the cherry tree, for reaſons before aſſigned,) ſhould therefore be trained in at full length, horizontally, and wherever there is a vacancy in the wall, ſome ſtrong adjoining branches ſhould be ſtopped, to make them produce new ſhoots to fill it. All fore-right ſhoots and ill ſituated buds ſhould alſo be rubbed off, or diſplaced, at the ſame time; for if they are ſuffered to grow large, and are then cut off, the tree will gum in that part (for cherry trees are hurt by the knife more than any other fruit trees): but care muſt be taken not to rub off the ſides, or ſpurs, which iſſue from the two or three years old wood; becauſe it is upon them that the greateſt part of the fruit is produced, and they will continue fruitful for ſeveral years. It is for want of duly obſerving theſe cautions, that cherry trees are often ſeen ſo unfruitful; eſpecially the morello, which, the more it is cut, the weaker it ſhoots, till it often is at laſt deſtroyed by frequent pruning.

*Plum* trees produce their fruit not only upon the laſt year's wood, but alſo upon curſons, or ſpurs, which come out of the wood that is many years old: ſo that there is not a neceſſity for ſhortening the branches, in order to obtain new ſhoots annually, in every part of the tree (as muſt be done with peaches, nectarines, &c.); ſince the more theſe trees are pruned, the more luxuriant they grow, until their ſtrength is exhauſted, and they then gum and ſpoil. The ſafeſt method to manage plum trees is therefore, to lay in their ſhoots horizontally, as they are produced, at equal diſtances, in proportion to the length of their leaves: and where there is not a ſufficient quantity of branches to fill up the vacancies of the trees, there the tops of the branches may be pinched off in the beginning of May, as before directed for peach trees, to make them put out lateral ſhoots to ſupply thoſe chaſms. This, and the diſplacing of all irregular and fore-right ſhoots and buds, as faſt as they are produced during the growing ſeaſon, will render theſe trees beautiful and flouriſhing, and there will be but little occaſion for cutting them in the winter, which is of bad conſequence to all ſorts of ſtone fruit; becauſe, by ſhortening of their branches, the fruit is cut away, and the number of ſhoots increaſed: for whenever a branch is ſhortened, two or more ſhoots are commonly produced from the eyes below the cut. This, with unſkilful pruning, crowds the tree with ſuch numbers of branches, that it produces only ſmall and ill taſted fruit; and by not allowing it a ſufficient ſpace to ſpread in, at the time of planting, occaſions, what is too often ſeen, that every branch of a fruit tree, howſoever improper for it, undergoes the deſtructive diſcipline of the knife. The only way to avoid this mangling, is to give the trees ample room, and to extend their branches at full length.

*Pear* trees may be pruned at any time after their fruit is gathered, until the beginning of March; but the ſooner it is done, the better: though the deferring of it till ſpring is not ſo injurious to theſe, as it is to ſome of the tender fruits. They generally produce their bloſſom buds firſt at the extremity of the laſt year's ſhoots, ſo that if theſe are ſhortened, the bloſſoms are cut off, and by means of the new ſhoots which are then produced from the eyes immediately below the cut, the tree becomes too much crowded with wood: beſides which, if the buds which are thereby made to put out ſhoots were left untouched, they would produce curſons, or ſpurs, and theſe would bear fruit. The growth of a pear tree ſhoot ſhould therefore never be checked, unleſs there be a neceſſity for new wood to fill up a vacancy; but the branches ſhould be trained horizontally as far as they will go. Mr. Miller ſays [h] he has ſeen them upwards of twenty feet long from the trunk of the tree, and fruitful their whole length; for their curſons or ſpurs, which continue fruitful many years, are frequently emitted from branches three or four years old. The chief point therefore

[h] *Gardener's Dict.* Art. PYRUS.

fore is, to look them over carefully in the growing ſeaſon, to rub off all miſplaced buds and ſhoots, and to train in ſuch of theſe as are left, regularly to the wall By managing them thus in the ſummer, and diſplacing all luxuriant ſhoots as ſoon as they are produced, theſe trees will want but little pruning in the winter.

The ſame care as was before directed for peaches, to water the trees, to keep the earth looſe about them, that it may the better admit rain and dew to their roots, and to lay mulch upon it's ſurface over the roots, is equally neceſſary here, after the fruit is ſet, and whilſt it grows: and ſo it likewiſe is to recruit the ſoil with ſome ſuch dreſſing as was there adviſed, in the autumn of each alternate year. A thorough trenching of the ground every winter will alſo be of ſignal ſervice to theſe, and indeed to all other fruit trees, eſpecially when they begin to be old, provided due regard be paid to their roots; for unleſs theſe are rightly attended to, their heads cannot be expected to thrive.

In the gathering of pears, great care ſhould be taken not to injure the bud which is always formed upon the ſame ſpur, cloſe to the bottom of the foot ſtalk of the fruit, for the next year's bloſſoms. This is often ſpoiled, by forcing off the pear before it is ripe: but if the fruit is left till it has acquired a proper maturity, and then gently turned upward, it's foot ſtalk will part from the ſpur without hurting the bud.

All ſummer pears ſhould be gathered as they ripen; for none of them will remain good above a day or two after they are taken from the tree, nor will many of the autumn pears keep good above ten days, or a fortnight, after they are gathered. The winter fruits ſhould hang upon the tree as long as the ſeaſon will permit without danger of their being nipped by the froſt; for when this happens to them, their juices become flat and ill taſted, and they rot ſoon after. If the ſeaſon continue mild until the end of October, that will be a good time for gathering them: but this muſt always be done in dry weather, and when the trees alſo are perfectly dry. As they are gathered, they ſhould be laid gently, one by one, in a broad flat baſket, with great caution not to bruiſe them; and when they are carried into the ſtore room, they ſhould be taken out ſingly, and each ſort be laid up by itſelf in a cloſe heap on a dry place, to ſweat for ten days or a fortnight, during which time the windows ſhould be open to admit the air, in order to carry off the moiſture that is perſpired by the fruit. The manner of keeping them afterwards, and that for a conſiderable length of time, being nearly the ſame as for apples, will be ſpoken of fully in the Article of ſtandard fruit trees.

*Fig* trees will thrive in almoſt any ſoil or ſituation; but they will not produce fruit unleſs they ſtand in a free open air. They yield the moſt, and beſt, upon a ſtrong loamy ſoil, or upon a gentle loam about a foot or a foot and an half thick, lying over chalky land. When they are planted in dry ground, their fruit is apt to drop off in May or June, if that ſeaſon be alſo dry. To prevent this, the trees ſhould be well watered, and the ground covered with mulch, to render it ſomewhat moiſt.

In warm countries, theſe trees are raiſed from their ſeeds; but in England they are propagated by ſuckers from their roots, by cuttings, or by layers. Suckers are a bad method, for reaſons before repeatedly aſſigned. The cuttings, which ſhould be taken from the trees in autumn, becauſe they are then leaſt liable to bleed, muſt be choſen from the moſt fruitful, compact, and ſhorteſt jointed branches, and they ſhould have a part of the former year's wood at their bottom. The top ſhould be left entire, and not be ſhortened, as is uſually practiſed with other cuttings. If they are laid in a ſhady place for two or three days before they are planted, their wounds will be healed over, ſo as to prevent their being rotted by bleeding. They ſhould then be planted eight or nine inches deep, in a bed of loamy earth, in a warm ſituation; the ſurface of the ground ſhould be covered three or four inches thick with old tanner's bark, to keep out the froſt; and if the winter prove ſevere, their tops ſhould be covered with peas haulm, fern, or ſome other light covering, to protect them from the inclemency of the weather. This covering ſhould be taken off gradually in the ſpring, as ſoon as all danger of froſt is over; but the tan may remain, to prevent the drying winds of the ſpring, and the ſun in ſummer, from penetrating the ground ſo as to hurt the young plants. Theſe cuttings will be rooted ſufficiently by the following autumn, when they ſhould be tranſplanted into the places where they are to remain: and here again it will be right to ſhelter them with ſtraw or haulm during the enſuing winter.

Layers are the beſt method of propagating this fruit. Theſe, like the cuttings, ſhould be made from woody, compact, and well ripened ſhoots of the moſt fruitful trees; and not from young ſhoots full of ſap, whoſe veſſels are large and open, and conſequently very apt to bleed greatly. The beſt time for laying down the branches is in autumn. If the winter ſhould prove very ſevere, it will be right to cover the ground about them with ſome old tan, or any other ſort of mulch, to keep the froſt from hurting them, and in the autumn following they will be ſufficiently rooted to be ſeparated from the mother plant. It is beſt to tranſplant them into the places where they are to remain, as ſoon as they are thus cut off; though they may be left in their firſt place of growth till the ſpring, and be tranſplanted then: but they ſhould always be ſeparated from the old plants in the autumn, becauſe they are not then ſo full of ſap as in the ſpring; nor do they well bear tranſplanting when they are large. After they are planted out in the autumn, the ſurface of the ground about their roots ſhould be covered with mulch; and if the winter ſhould prove ſevere, it will be proper likewiſe to cover their tops with reeds, ſtraw, haulm, &c. as before directed for the cuttings.

Theſe trees are always planted as ſtandards in all warm countries: but in England they are generally planted againſt walls; though experience ſhews, from the few old ſtandards that we have, that they ripen their fruit full as well, if not better, upon ſtandards, than againſt walls; and that the former generally yield the greateſt crop. Mr. Miller is therefore clearly of opinion, that they ſhould be planted either in ſtandards or in eſpaliers, the laſt of which he thinks will ſucceed beſt in this country. I ſhall ſpeak of both in the next enſuing articles, and only give here his method of pruning this tree, with ſuch general directions as are proper to be obſerved when it is trained againſt a wall.

The branches of fig trees muſt never be ſhortened when they are pruned, becauſe all their fruit is produced at the upper part of the ſhoots of the preceding year; and beſides, the branches are very apt to die after the knife. The beſt way therefore is, when theſe are too cloſe together, to cut out all the naked branches quite to the bottom, and to leave only, at a proper diſtance from each other, thoſe which are beſt furniſhed with lateral ſhoots. That diſtance ſhould not be leſs than a foot, and the lateral ſhoots ſhould be laid four or five inches aſunder. Theſe trees ſhould be pruned in the autumn rather than in the ſpring, becauſe, like all other trees, they are leaſt replete with ſap in the former of theſe ſeaſons, and conſequently then leaſt liable to bleed *. Their branches ſhould alſo then be diveſted of all the autumnal figs; and the ſooner this is done after the leaves begin to fall off, the better the young ſhoots will reſiſt the winter's cold.

In ſome very cold and moiſt ſeaſons the young ſhoots of fig-trees will not harden, but remain ſoft and full of juice. When this happens, there is little hope of a crop of fruit the ſucceeding year; for the firſt froſt in autumn will kill the upper part of theſe ſhoots for a conſiderable way downward. The beſt way then is to cut off all the decayed part of the ſhoots, to prevent the infection from ſpreading to the parts which are ſound. It is chiefly from the four or five uppermoſt joints of the ſhoots that the fruit comes out; and for this reaſon as many as poſſible of the ſhort lateral branches ſhould be preſerved, and particular care ſhould be taken to promote a ſupply of young ſhoots in every part of the tree.

Fig-trees reared againſt walls ſhould be un-nailed at the approach of winter, and after having diveſted them of their remaining leaves, and of all the latter fruit, which hardly ever ripens in this country, (though the ſecond crop produced from ſhoots of the ſame year, is the principal one in warm climates,) their branches ſhould be laid down towards the ground, tied together in ſmall

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* A vigorous branch of a fig tree broken or cut off in the autumn will ceaſe to bleed in one day's time, or leſs; whereas a branch cut in the ſpring will often flow a week, or more, and the wound will be proportionably longer before it heals. MILLER's *Gardener's Dict.* Art. FICUS.

bundles, and, after being faſtened to ſtakes, to prevent their touching the earth, for fear of the damp which might mould them, as well as to ſecure them from being broken by the wind, they ſhould be covered over with ſtraw or litter, to guard them from the froſt. This covering ſhould be taken away gradually in the ſpring, as the danger of froſt decreaſes. The fact which I before hinted at [m] in regard to the miſtaken notion of benefiting fruit trees by planting them againſt walls, is remarkably evident from fig trees, which, in this country, almoſt always produce greater quantities of fruit when they are planted againſt walls which have a north or an eaſt aſpect, than when they are ſet to a ſouth or a ſouth eaſt wall; becauſe the fruit of theſe laſt is puſhed out ſo early in the ſpring, eſpecially if the beginning of that ſeaſon be at all warm, that the cold, which ſeldom fails to return here in April and May, nips the greateſt part of it, and cauſes it to drop off; whereas that of the former which comes out later, generally eſcapes this danger: much more will they be free from this accident when the trees are planted in eſpaliers or ſtandards.

Some perſons who are very curious in their fruit, and who do not mind a little extraordinary expence, erect againſt their walls trelliſes which extend from the inſide of one pier to the neareſt inſide of the next; where the walls are built with piers, as they muſt be for this purpoſe [n]. This frame work is conſtructed in the ſame manners as that for eſpaliers [o], like which it need not be ſet up till the trees are well ſpread, and begin to bear fruit plentifully; for they may be trained till then againſt any ordinary low eſpalier of aſh poles or other ſlender ſticks, in order not needleſsly to expoſe the trelliſes to the injuries of the weather; becauſe theſe, being generally made of regularly cut yellow deal, or oak, and run up higher, coſt more. Every fourth upright rail or poſt of the trellis ſhould be much ſtronger than the reſt, and faſtened to the wall with iron hooks, which it is beſt to fix in the wall at the time of building it. Theſe ſtrongeſt upright poſts ſhould be about three, but by no means more than four feet from each other. The croſs rails may be ſlight as for common eſpaliers; but they muſt be laid much cloſer together. For peach, nectarine, and apricot trees, for example, which, for the moſt part, produce their fruit on the young wood, the ſquares of the trellis frame ſhould not exceed three or four inches; but for trees which continue to bear on the old wood, they may be five or ſix inches wide, and for vines, eight or nine inches. The ſhoots of the trees are faſtened to this frame with ozier twigs, or rope yarn, or any other ſoft bandage, in the ſame manner as they are to eſpaliers: for they muſt not be nailed to either, becauſe that would injure the wood work.

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[m] *Page* 231.

[n] See before *p.* 16.

[o] For the manner of conſtructing eſpalier frames ſee the next Article.

Theſe trelliſes, which ſhould project about two inches from the wall, are thought to contribute greatly to preſerve the beauty of the fruit, by preventing its lying too cloſe to the wall, whilſt it has at the ſame time all the advantages of the heat reflected therefrom: nor are the walls where theſe are uſed hurt by driving nails into their joints, and drawing them out again every year, at the hazard of pulling out ſome of the mortar with them, and conſequently of weakening the wall, and making holes, in which ſnails and other vermin, may take ſhelter and breed.

Where it is not intended to have trelliſes, though the walls are built with piers, the planting of each tree in the middle of the ſpace between the piers will form a regularity pleaſing to the eye: but if trelliſes are to be erected, the trees ſhould be planted againſt the piers, that their branches may be on a ſquare with the rails to which they are to be faſtened.

## ARTICLE V.

### *Of the management of Fruit Trees in Eſpaliers.*

THE trees for eſpaliers ſhould not be planted at ſo great diſtances as againſt walls, becauſe, if their branches are extended to a very great length, they have not ſo ſteady a ſupport, nor can their gaps be filled up ſo equally with bearing branches; the want of which creates a great deformity to the eye.

The eſpalier or frame, to which the trees are to be trained, ſhould not be made till the third year after they are planted; for a few ſhort ſtakes driven into the ground on each ſide of them, to faſten their branches to in an horizontal poſition, as they are produced, will be ſufficient to train them properly to the form in which they are to grow. The cheapeſt way of making theſe eſpaliers is with aſh-poles, of two ſizes, *viz.* large ones, cut about ſix feet and an half long, for upright ſtakes, which muſt be ſharpened at their biggeſt end, and driven into the ground at a foot diſtance from each other, in a ſtrait line, and at an equal height of about five feet from the ground; and ſlender ones, to be nailed along upon the tops of the upright ſtakes to keep them exactly even; and alſo to croſs them, at about nine inches diſtance row from row, from the top to the bottom. Theſe croſs poles ſhould be faſtened to the ſtakes with wire; their ends ſhould be cut flat, and nailed to them, for greater ſecurity againſt high winds and other accidents; and if the whole is painted over, or oiled, it will laſt a long while. Eſpaliers made with ſquare timbers, cut to ſuitable ſizes, are indeed more ſightly; but they are much more expenſive, and neither laſt longer, nor anſwer the purpoſe at all better, than the former.

When the eſpalier is thus framed, the branches of the trees muſt be faſtened to it with ſmall oſier twigs, rope yarn, or ſome ſuch binding; obſerving to train them in an horizontal poſition, and at equal diſtances proportioned to the ſize of the fruit and of the leaves; and with care not to croſs any of them, or to lay them in too thick. The branches of the largeſt fruits ſhould be at leaſt ſix or eight inches aſunder; but four or five will be ſufficient for thoſe of leſſer growth.

The trees chiefly planted for eſpaliers are *Apples*, *Pears*, and ſome *Plums*. The dutch ſtocks, as the gardeners call them, are reckoned the beſt for apples, and quince ſtocks for pears, when trained in this method, becauſe they prevent the trees from growing too luxuriant, make them produce fruit pretty ſoon, and continue many years in vigour. But, though I differ herein from perhaps all gardeners, the golden pippin ſeems to me almoſt the only apple really fit for eſpaliers *. The profeſſors of this art have indeed given a long liſt of other ſorts; but I leave to thoſe adepts the care of managing them properly, if they can, when cultivated in this way: for it is certain that moſt of them, and eſpecially the nonpareil, which they recommend particularly for this purpoſe, love to run up in ſtandards, and that they bear the beſt and higheſt flavoured fruit when they are reared as ſuch.

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* The Golden Pippin is a fruit peculiar to England. There are few other countries where it ſucceeds well; nor does it produce ſo good fruit in many parts of this, as were to be wiſhed. This is in ſome meaſure owing to it's being grafted on free ſtocks, which enlarge the fruit, but render it leſs valuable, becauſe it's fleſh is then not ſo firm, nor its flavour ſo quick, as they ought to be, and it is apt to be dry and mealy. It therefore

With regard to *Pears*, the ſummer and autumn kinds may do well enough in eſpaliers, if they are of the ſmall ſpecies; but the luxuriant large ſorts or the winter kinds will not: and as to *Plums*, in general, they ſeldom proſper rightly in this way; firſt, becauſe they ſhoot greatly; and ſecondly, becauſe they cannot bear ſo much cutting as is commonly uſed in this method: for it may be laid down as a conſtant rule, that trees which will not bear much pruning are not fit for eſpaliers; becauſe there will conſequently be gaps not eaſily filled up, and their gumming, or bleeding, is an inſuperable obſtacle to their laſting long.

*Cherry* trees are by no means fit for eſpaliers, becauſe they are very apt to be killed by cutting, to gap extremely, and to be blighted in this ſituation: neither ſhould they, for theſe reaſons, be planted againſt walls.

In the pruning of apple trees, the chief point is, never to ſhorten any of the branches, unleſs there be an abſolute want of wood to fill up the vacancies in the eſpaliers; for where the knife is much uſed, it only multiplies uſeleſs ſhoots, and prevents their fruiting; ſo that the beſt way of managing theſe trees is, to look them over care-

therefore ſhould always be grafted upon the crab ſtock, which will not canker like the others; and though the fruit will not be ſo fair to the ſight, yet it will be better flavoured. MILLER's *Gardener's Dict.* Art, MALUS.

fully in the growing ſeaſon, to rub of all ſuch ſhoots as are irregularly produced, and to train the others down to the frame work, in the poſition they are to remain. If this is carefully performed in the ſummer, little will remain to be done in the winter; and by bending their ſhoots down from time to time, as they are produced, there will be no occaſion to uſe force to bring them to a proper ſituation, nor any danger of breaking the branches. The diſtance at which theſe branches are trained from each other ſhould be about ſeven inches for the largeſt ſorts, and four or five for the ſmaller.—All apple trees produce their fruit upon curſons or ſpurs, ſo that theſe ſhould never be cut off; for they will continue fruitful a great number of years.

The very circumſtance of theſe trees not bearing the knife, is an argument againſt their being fit for eſpaliers, and for their being proper to be raiſed only as ſtandards.

It will add greatly to the beauty of the eſpalier, if only ſuch trees as grow to an equal height, or as nearly equal as can be, are planted in the ſame row. However, all of them ſhould be ſpread low, horizontally, that their fruit may enjoy the benefit of the heat of the ſun reflected from the earth; much rather than be ſuffered to run up high. The largeſt growing ſorts of apple trees, when planted for eſpaliers, ſhould be allowed from twenty five to thirty feet, thoſe of the middle growth about eighteen feet, and the ſmalleſt, ſuch for example as the golden pippin, at leaſt twelve feet, to extend themſelves in.

When the trees are arrived at the full extent allowed them in the eſpalier, it becomes indiſpenſably neceſſary to cut them ſo as to keep them within the intended limits. For the reaſons already given the winter is the only time for doing this, becauſe, the ſap then being at reſt, the growth of the fruit buds will not be interrupted by the riſing of young ſhoots. This is a precaution ſo little attended to, and indeed ſo generally counteracted, that I would recommend it to the particular obſervation of all gentlemen gardeners; for it is for them chiefly that I here write.

To the greater advantage which eſpaliers have over walls, in that, as before hinted [p], they do not, like them, reflect cold and blighting winds, and are more eaſily ſheltered by fixing up againſt them the reed ſkreens already mentioned [q], in the ſpring, when the trees are in bloſſom, and letting them remain till the fruit is out of danger; and alſo in the autumn again, if that ſeaſon ſhould prove bad, for they * will then forward the ripening of the fruit, and prevent it's being blown down by high winds; I muſt here add, that when the roots of the eſpalier trees have reached the well looſened ground within the quarters of the kitchen garden, the trees themſelves, finding there a more plentiful ſupply of food than thoſe which are planted againſt walls can meet with in their confined borders, will flouriſh with redoubled vigour. The borders of the eſpaliers ſhould alſo be well dug, or forked, from time to time, to prevent their growing hard; and it will be right to enrich them with a good dreſſing, every other year, as before directed [r].

*Fig* trees are cultivated in eſpaliers, with good ſucceſs, in many parts of Germany. The method there, which it would be adviſeable to follow in this county, is, to looſen their branches at the end of autumn, and then to tie them in bundles, and cover them with ſtraw, or haulm, as before adviſed[s] for thoſe that are planted againſt walls. They are thus preſerved from the injury of cold during the winter, and are faſtened up again as ſoon as the danger of froſt is over. The trees thus managed generally produce great crops. Their culture is, in other reſpects, the ſame as before directed[t]. Reed hedges are alſo of great ſervice here, by placing them every night on each ſide of the eſpalier, whenever there is danger of cold winds or froſty nights, and taking them away in the day.

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[p] *Page* 232, *and* 235. [q] *Page* 234.

* Theſe reed hedges may be purchaſed for one ſhilling a yard, running meaſure, at ſix feet and an half high; and if they are carefully laid up, when done with, under a ſhed, or otherwiſe, ſo as to be kept from the weather, they will laſt ſeven or eight years.

[r] *Page* 251, *and* 255.

## *ARTICLE* VI.

### *Of the management of Standard Fruit Trees.*

TO the directions before given for raiſing, graſting, tranſplanting, and training ſuch ſtocks as are intended for ſtandard fruit trees, and to the advantages which theſe receive, not only from their ſituation, but alſo from their not being hacked and mangled with the knife, as all eſpalier and wall trees are, in order to keep them within certain ſtated forms and limits, howſoever repugnant this may be to nature[u]; I muſt here add, as properly belonging to this head, though at the hazard of repeating what has been already ſaid, that theſe ſtocks ſhould not exceed two years growth from the bud, or graft, when they are planted; that they ſhould be faſtened to ſtakes till they have acquired ſufficient ſtrength not to be in danger of being blown out of the ground; and that the ſole art of pruning them, when grown up to be trees, conſiſts in cutting out all ſuch irregular croſs branches, as, if left, would rub againſt and gall others, when agitated by high winds, and alſo all decayed branches; but that none of the ſhoots of theſe trees ſhould ever be ſhortened. All ſuckers or ſhoots from their ſtem or roots ſhould be removed as ſoon as they appear; and when any branches are broken by the wind, or other accident, theſe ſhould be cut off, either down to the diviſion of the branch, or cloſe to the ſtem from whence it was produced. The beſt time for this work is in November; for it ſhould not be done in froſty weather, nor when the ſap begins to be in motion in the ſpring.

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[s] *Page* 259. [t] *Page* 256—260.

[u] See the preceding *ARTICLES* I, II, and III.

If theſe trees grow top heavy, ſo as to endanger their being broken by winds, it is neceſſary to lighten the upper burden. This ſhould be done by cutting off part of the large branches, and leaving a leading branch to carry on the circulation, rather than by taking a branch off quite cloſe to the body; becauſe this muſt neceſſarily leave a large wound, which, by affording lodgement to water, will endanger the rotting of the tree. The moſt effectual way to prevent this accident whenever any conſiderable part is cut off, is, to cover the wound with grafting clay or wax, and to tie over that a piece of tarpawlin, or of ſheet lead.

As it never is adviſable to place many ſtandards in a kitchin garden, becauſe their ſhade and the dripping of their leaves would injure the plants within their reach; I need not here mention the diſtances at which they ſhould be ſet. That will be directed when I come to ſpeak of the Orchard, to which it properly belongs to have a great number of theſe trees. A few of them may indeed, as is the general cuſtom, be ſet here and there in the quarters of large gardens, without their doing much hurt: but the more irregular parts of the garden, of which there ſeldom fails to be ſeveral about the ſkirts of extenſive grounds, are fitteſt for theſe trees; eſpecially, if they be ſuch as are apt to grow to a large ſize. The ſmaller kinds are preferable for the inſide of the quarters. Among theſe I claſs particularly all the ſtone fruits: for I cannot agree with any of our profeſſed gardeners in thinking that none of theſe ſpecies, except the Breda and the Bruſſels apricots are fit for ſtandards; becauſe I am convinced, as well from the experiment before related [u], as from ſeveral others, and from the very nature of the thing, that, taking one year with another, all fruits are more perfectly ripened and conſequently acquire a higher flavour, upon ſtandard trees, than in eſpaliers, or againſt walls. Their ſize may indeed be ſmaller, and their appearance leſs beautiful to the eye: but their ſuperior goodneſs will make ample amends for theſe comparatively trifling deficiencies.

I therefore have nothing farther to ſay on this head, unleſs it be, to ſpeak of the culture of ſuch fruit trees, fit for ſuitable places in the kitchen garden, as do not belong to either of the foregoing articles of Eſpaliers and Walls: and to complete my promiſe in regard to the preſervation of fruit laid up for keeping.

*Almond* trees have a beautiful effect in a garden whilſt they are in bloom; and accordingly they are cultivated in this country, more for the ſake of their flowers, than for their fruit: though this laſt is alſo well worth attending to, and may, with proper care, in a well ſheltered warm ſituation, be produced very good in England.

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[u] *Page* 235, 236.

Theſe trees are propagated by inoculating a bud of them into a plum or a peach ſtock, or into a ſtock of their own kind, in the month of July. The next ſpring, when the buds ſhoot, is the time to train them up, either for ſtandards, or for half ſtandards, as the cultivator chooſes: though the uſual method is to bud them at the height intended for their ſtems. In the ſecond year after budding, they will be fit to tranſplant into the places where they are to remain. The beſt ſeaſon for doing this is in October, as ſoon as their leaves begin to decay, if they are to ſtand in dry ground; but if they are to be removed into a wet ſoil, February is a far more preferable time. It is likewiſe to be obſerved, that plum ſtocks will always prove the beſt for this laſt, and almond or peach ſtocks for the former ſituation.

The bloſſoms of theſe trees often appear in February, when the ſpring is forward: but if froſt comes on while they are out, their beauty is of ſhort duration, for they are at once deſtroyed, and they then produce very little fruit. On the other hand, if theſe trees do not flower till late in March, they ſeldom fail to bear plenty of almonds, many of which will be very ſweet, and fit for the table when green: but they will not keep long.

*Fig* trees (the method of propagating which, and of training them to walls and eſpaliers has already been given [x],) are, from experience, found to produce the greateſt crops of fruit when they are reared as ſtandards. But yet, ſuch is the force of prejudice, the cuſtom of planting them againſt walls ſtill prevails among us, notwithſtanding the contrary example of other nations, and particularly of thoſe which are moſt famous for the culture of theſe trees. They always make them ſtandards, and conſtantly find their account in ſo doing. The miſtaken notion that their branches are then moſt liable to be killed by froſt, in ſevere winters, may be eaſily and effectually got over, by tying together as many of them as can be conveniently brought into a bundle, and then wrapping them over with hay-bands, ſtraw, haulm, or ſome other light covering, which ſhould be taken off gradually in the ſpring, in order not to expoſe the ſhoots too ſuddenly to the open air. The ſame may alſo be laid round the ſtems, and upon the ground about their roots, for a yet farther ſecurity, if it be thought neceſſary: but in doing this, great care ſhould be taken that neither rats nor mice harbour in this covering; for they will eat off the bark of the ſhoots, and thereby kill them. Mr. Miller has often obſerved this in many of the largeſt branches of fig trees which were planted againſt walls[y]. The winter is the time when theſe vermin do this miſchief; and therefore they ſhould be carefully watched at that ſeaſon.

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[x] *Page* 256, 259, 266.

The common blue fig, and the common white, are the ſorts moſt generally cultivated in England. This laſt is a great bearer, and its fruit is very ſweet: but neither it, nor the former, is to be compared to the brown or cheſnut-coloured Iſchia fig, or the ſmall white early fig, for hardineſs or for taſte. Theſe are not eaſily hurt by any of our froſts; and their fruit ripens ſo well with us, that they have been known, not unfrequently, to produce a tolerably good ſecond crop, in this country, when the ſeaſons have been favourable. The Iſchia fig, which is purple within, is highly flavoured, and grows to the largeſt ſize of any of this kind of fruit. The white early fig is white within and ſweet; but not high flavoured.

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[y] *Gardener's Dict.* Art. Ficus.

*Filberts* may be propagated by ſowing their nuts in February, till which time theſe ſhould be kept in ſand, in a moiſt cellar, where no vermin can get at them: but the moſt expeditious way, and the ſureſt to obtain the ſorts deſired, is to raiſe them from layers.

*Medlar* trees may be raiſed by grafting or budding them upon the common white thorn. This is the uſual way of propagating the American ſorts (which are of the haw-thorn kind); but the beſt way to raiſe the other ſorts is from their ſeeds. All medlars will take when they are grafted or budded upon each other. They will alſo take upon ſtocks of pears, or of quinces, and both of theſe will take upon the medlar; ſo that there is a great affinity between them. All the American ſorts will grow twenty feet high, if they are not ſtinted by grafting.

Medlars may alſo be raiſed from their ſeeds, which, if put into the ground in autumn, ſoon after they are ripe, will come up the following ſpring; but if they are not ſet till the the next year, they will not ſhoot till the year after.

*Mulberry* trees may be raiſed either from ſeeds, from cuttings, or from layers. The branches which are laid down for layers will take ſufficient root in one year, and ſhould then be ſeparated from the mother tree. But as theſe branches, which ſhould always be the moſt fruitful that can be ſingled out upon an old tree, (for thoſe of young ones are not near ſo good, nor is the fruit of theſe laſt ever ſo large or ſo well flavoured as that of the former,) are often ſituated ſo high that they cannot be layed otherwiſe than by raiſing up to them boxes or baſkets of earth, and ſupporting them there till the layers have taken root, and are cut off; it is found to be more convenient to propagate theſe trees by cuttings; for theſe, if rightly choſen (likewiſe from the moſt fruitful branches of old trees), and ſkilfully managed, will take root very well; and, which is an advantage peculiar to this method, they may be brought from diſtant trees. Theſe cuttings, which ſhould be ſhoots of the former year, with one joint of the two years wood at their bottom, ſhould not be ſhortened, but buried their full length, ſo as to leave only two or three buds above ground. The beſt time for planting them is in March, after the danger of hard froſt is over. They ſhould be ſet in light rich earth, ſuch as is that of moſt of the old kitchen gardens about London; for that is the ſoil in which the mulberry tree delights, provided it be alſo very deep *. The ground ſhould be preſſed cloſe about the cutting; and if they are covered with glaſſes, their rooting will be forwarded. Where theſe are wanting, the ſurface of the earth about them ſhould be covered with moſs, or mulch, to prevent it's drying; for they ſhould be watered but little. If the cuttings make good ſhoots, they may be tranſplanted the next ſpring into a nurſery, where their ſtems ſhould be trained up regularly, by faſtening them to ſtakes, and pruning off cloſely all their lateral branches, except perhaps two or three of the weakeſt, which

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* Mr. Miller obſerves, that he has ſeen in ſome of thoſe gardens mulberry trees of a very great age, which are extremely healthy and fruitful, and that their fruit is larger and better flavoured than that of younger trees: but that he has never ſeen any mulberry trees which have been planted in a very ſtiff ſoil, or in ſhallow ground, either upon clay, chalk, or gravel, thrive or bear well. So far from it, that the ſtems and branches of theſe have always been covered with moſs, and what little fruit they have ſometimes yielded has been ſmall, ill-taſted, and late before it ripened. *Gardener's Dict.* Art. MORUS.

may be left to carry on the circulation of the ſap, for the increaſe of the ſtem: for when they are totally diveſted of their ſide ſhoots, all the ſap is drawn up to the top, and the head then grows too faſt for the ſtem, and becomes too heavy to be ſupported by it. After about four years growth in the nurſery, theſe trees will be fit to tranſplant where they are to remain: for they may be removed with greater ſafety while young, than when they are of a large ſize.

Mr. Miller has found the cuttings of mulberry trees take root much ſooner in a hot bed than in the common ground: but either there, or in any other place fully expoſed to the ſun, they ſhould be ſhaded with mats during the heat of the day, till they have taken root.

The only pruning which this tree requires, is to cut away all dead wood, and to diſplace ſuch croſs branches as would otherwiſe be apt to rub againſt, and to gall, each other: for as it produces it's fruit upon ſhoots of the ſame year's growth, which proceed from buds at the extremities of the former year's wood, none of theſe ſhould ever be ſhortened.

The white mulberry is the ſort which is cultivated in France, Italy, Spain, and other parts of Europe, and, I believe, in America, for it's leaves to feed ſilk worms: but the Perſians and the Chineſe always make uſe of the common black mulberry for that purpoſe; and it is ſaid by ſome who have tried both, that the worms fed with the leaves of this laſt, produce much better ſilk than thoſe fed with the former. To this is added, that the leaves of the black ſort ſhould never be given to the worms after they have eaten for ſome time of the white, leſt they ſhould burſt them.

The white mulberry is as hardy as the black, and may be propagated in the ſame manner: but the moſt expeditious way of raiſing numbers of theſe trees is from their ſeeds, which may be had in plenty from the ſouth of France, or Italy. The beſt way of ſowing them here is upon a moderate hot bed, where they ſhould be covered about a quarter of an inch deep with light earth: and the moſt proper time, for this country, is about the middle of March. The plants will come up in five or ſix weeks: but as they are tender at firſt, the hot bed ſhould be arched over with hoops, and theſe ſhould be covered with mats, to ſhade the plants in the heat of the day, and to protect them from cold at night: and it ſhould be watered pretty frequently in very dry weather. They muſt be kept clean from weeds during the enſuing ſummer, and ſheltered again, as before, from the time that the froſts begin to come on in autumn. With this management, for they do not require any other culture, they will be fit to tranſplant the next March into the nurſery, where they may remain two or three years, to get ſtrength; and then they ſhould be removed into the places where they are to remain.

The trees which are intended for feeding of ſilk worms ſhould not be ſuffered to grow tall, but ſhould rather be kept in a ſort of hedge; and inſtead of pulling off their leaves one by one, it is better to clip them off with a pair of ſhears: for this is much ſooner done, and with leſs detriment to the tree.—— The author of one of the papers in the Philoſophical Tranſactions[y], ſpeaking of the propagation of mulberry trees for the food of ſilk worms, ſeems to think that it may be a yet better way to ſow ſome acres of land with mulberry ſeeds, and to cut the plants with a ſcythe, ſo as to keep them always low: and Dr. J. Beale, in the ſame valuable collection[z], is of opinion,

[y] No. 12.

[z] No. 116.

that, wherever the mulberry tree grows, there the ſilk worm will live and ſpink good ſilk.

*Quince* trees are eaſily propagated, either by ſuckers, or cuttings, planted in a moiſt ſoil. Suckers are the worſt to raiſe them from, for reaſons before aſſigned; and cuttings are generally preferred to layers, becauſe they are of more ſpeedy growth. Theſe cuttings ſhould be ſet early in the autumn, and ſhould be watered often, to encourage their rooting. In the ſecond year after planting, they will be fit to remove into the nurſery, where, after being ſet a foot aſunder in rows three feet diſtant from each other, they ſhould be managed as before directed for apples. After two or three years growth in the nurſery, they will be large enough to tranſplant into the places where they are to remain. A moiſt ſituation, ſuch, for example, as the ſide of a river, pond, or ditch, will make them produce the moſt, and the largeſt, fruit: but that which grows on a dry ſoil will be better taſted, and earlier ripe. Theſe trees require no other pruning, than keeping their ſtems clear from ſuckers, cutting away all croſs branches, and diſplacing all upright luxuriant ſhoots from the middle of the tree, that it's head may not be crowded with wood; for that is of bad conſequence to all fruit trees. A ſure way to have the beſt ſorts, is to graft or bud them upon ſtocks of their own kind raiſed from cuttings. The trees ſo managed will bear fruit much ſooner, and more plentifully, than thoſe which are raiſed from ſuckers or layers.—— The Portugal quince is the moſt valuable.

Having now pointed out the ſeveral methods of obtaining each ſort of fruit from the tree, it will be right to conſider the means by which it's poſſeſſor may beſt and longeſt preſerve that ſweet reward of his expence and care; whether it be, in order to enjoy the laudable pride of entertaining his friends with the ſalutary product of his own labour; or, if profit be his aim, to keep it till it will fetch a price proportioned to the advance which every commodity bears when it is ſcarce.

To proceed more rationally in this inquiry, it will be proper to examine, firſt, what it is that haſtens putrefaction in fruit, and then to conſider the means of guarding againſt every ſuch cauſe.

Thouſands of objects teach us, that moiſture and warmth are the great cauſes of putrefaction. From the decay of many otherwiſe laſting bodies, we learn, that the alternate changes of heat and cold, of dryneſs and moiſture, moulder to pieces even the ſolid oak. Theſe general cauſes of putrefaction and decay ſhould therefore be avoided, or prevented, as much as poſſible: and to this end an equal ſtate of the air, with regard to heat and dryneſs, becomes neceſſary in a repoſitory for the preſervation of fruit. The want of dryneſs renders cellars, in general, unfit for this purpoſe: though ſome of them may, perhaps, be dry enough; and if they are, the other requiſite, of an equal ſtate of heat, is uſually found in them: but as this is not often the caſe, it is ſurely worth the gentleman's while to provide a receptacle on purpoſe for his fruit. A cloſet ſurrounded every way with good walls, and furniſhed with double doors, promiſes the beſt ſucceſs. In this cloſet, different compartments, or bins, may be made of brick, which continues much drier than ſtone or wood. Large jars, or caſks, will alſo anſwer the ſame end, when they are cloſely ſtopped; and ſo do boxes, as is well known to the London fruiterers. Either of theſe may be proportioned to the quantity which it is adviſeable to keep in each: I mean, to the quantity that is to be conſumed within a few days; for even in ſuch a place, the fruit ſhould be expoſed to the air as little as can be, before it is eaten. Experience will ſoon ſhew to the good manager the importance of this caution.—Eggs afford a manifeſt inſtance of the advantage of a ſeemingly ſlight protection from the ingreſs and egreſs of air, by the long while (ſome months) that they will keep ſweet and freſh, when covered all over, uniformly, with only a thin coat of any unctuous matter.

Chance convinced an excellent and attentive houſewife of the ſucceſs of ſuch care as is here recommended for the preſervation of fruit. Her reſidence was then in Switzerland, where the honſes are generally built of ſtone, with thick walls, in which there are frequently cupboards, if I may ſo call them, which ſhut with doors exactly fitted to them. In one of theſe, this lady put a plate of fruit, I think it was ſummer fruit; but I will not be poſitive as to that circumſtance, having loſt the memorandum which I made of this fact when it was related to me. Likewiſe by chance, this cupboard was not opened till ſome months after, when, to her great ſurpriſe, the fruit was plump and ſound, and had loſt very little of it's original flavour.

When the fruit (I here mean chiefly apples and pears, for they are the fitteſt for keeping,) has been carefully gathered by hand, in perfectly dry weather, and ſweated for ſome days, in heaps on a clean floor, as before directed, till it has diſcharged it's watery and crude juices; each apple or pear muſt be rubbed ſingly with a coarſe cloth, to clean and dry them, and if the leaſt hurt or ſpeck, tending to putrefaction, appears at this wiping, all the fruit ſo marked muſt be laid aſide, as unfit for keeping. A layer of very dry ſtraw ſhould be laid at the bottom of the veſſel, whatever

ever it be, in which they are to be preſerved, and upon this a layer of perfectly ſound apples, or pears; then another layer of ſtraw over them, a layer of fruit upon this, and ſo alternately, till the whole intended quantity is put in. I have named ſtraw, becauſe it is eaſieſt to come at: but any other ſubſtance which is perfectly dry, and leaſt liable to corruption, will do. If, therefore, each layer of fruit is ſheltered above and below with a covering of paper, to preſerve it from the taſte which ſaw-duſt might give it, this bids fair to anſwer the deſired purpoſe. On this principle it is that roots are preſerved in ſand: the only objection to which, for the uſe here intended, is, that it's weight may hurt the fruit: otherwiſe, it promiſes well, when perfectly dry.

## *ARTICLE* VII.

### *Of Fruit-bearing Shrubs.*

*CURRANTS* are eaſily propagated by planting their cuttings in a ſpot of freſh earth at any time between the beginning of September and the the middle of October. If they are ſet in rows, a foot aſunder, kept clear from weeds, and watered in very dry weather, they will be fit to tranſplant into the places where they are to remain at the end of one year; or they may be left two in the nurſery, where they ſhould, in the mean while, be trained for their future deſtination, either by rubbing all the buds off their ſtems, to the height of about one foot if they are to be ſtandards, or by rendering them flat, if they are deſigned for walls, pales, or eſpaliers. The younger they are planted out, the better they will ſucceed. The beſt ſeaſon for this is ſoon after their leaves begin to decay; becauſe they will then have time to take root before the winter comes on, ſo as not to be in danger of ſuffering from drought in the ſpring. The fruit of theſe ſhrubs is faireſt to the eye when they are planted againſt eſpaliers, pales, or walls, for which their diſtance from each other ſhould be ten or twelve feet. If they are ſet in rows, for ſtandards, as is the common practice of the gardeners who cultivate their fruit for ſale, the rows ſhould be ten feet aſunder, and the plants in the rows four feet from each other. Their fruit will ripen a fortnight or three weeks ſooner againſt a ſouth-eaſt wall or pale, than it will in the open air; and it will be proportionably later againſt a north wall or pale; ſo that by theſe means it may be continued a long time in perfection, eſpecially if the north pales are ſhaded with mats in the heat of the day, to retard the ripening of the fruit.

The pruning of theſe ſhrubs is very eaſy: for as they produce their fruit upon the former year's wood, and upon the ſmall ſpurs (the gardeners call them ſnags) which come out of the old wood, the only eſſential things to be obſerved therein are, not to let their ſhoots grow too cloſe together, and never to cut off their ſpurs.

Theſe plants will thrive in almoſt any ſoil or ſituation: but their fruit is always beſt when they grow in the open air, and upon a light loamy ſoil.

The Champaign currant, which is of a pale red colour, and the white and the red Dutch currants, are the largeſt and the moſt eſteemed. The black currant is baniſhed from the table, on account of it's ſtrong diſagreeable flavour: but a rob is made of it, which is of excellent uſe in caſes of ſore throats and quinſies.

*Gooſberries* are propagated either by ſuckers taken from the old plants, or by cuttings. Theſe laſt are by far preferable, becauſe they generally root the beſt, and are leaſt apt to produce ſuckers, which always weaken the ſtock from whence they proceed. The cuttings ſhou'd be taken from the handſomeſt ſhoots of the beſt bearing branches of the moſt fruitful ſhrubs : they ſhould be about ſix or eight inches long, and ſhould be taken off, and planted, in autumn, juſt before their leaves begin to fall, about three inches deep, in light earth, expoſed to the morning ſun. Their growth will be promoted by watering of them gently in dry weather, and they will be trained up regularly to a ſtrait ſtem, if all their under ſhoots are rubbed off in the ſummer, as ſoon as they appear, ſo as to leave only the uppermoſt or ſtrongeſt. In the next October, theſe plants will be fit to remove into a nurſery, where, after trimming their roots, and cutting off all ſide branches, they ſhould be ſet a foot aſunder in rows three feet diſtant from each other, in an open ſpot of freſh earth, which has been well dug, and cleanſed from all noxious weeds and roots. They ſhould here be faſtened to ſhort ſticks, or ſtakes, the more effectually to render their ſtems ſtrait and upright; they ſhould be cleared from all lateral ſhoots to the height of about a foot above the ſurface of the earth; and after one year's training in this manner (keeping them clear from weeds, and cutting out all croſs branches, ſo that their heads may not become too thick), they will be fit to tranſplant to the places where they are to remain. The ſoil, for them to thrive to the greateſt advantage, ſhould then be a rich light ſandy earth; though they will do very well in middling ſoils which are not too ſtrong or moiſt, and in all ſituations. However, their fruit is beſt when they grow in an open expoſure, and not within the ſhade of other trees. The beſt ſeaſon for this tranſplanting is likewiſe in October, when their leaves begin to decay; and it will alſo be right then to trim their roots again, to diveſt them of all lateral and all croſs ſhoots, and to ſhorten all their long branches, ſo as to make the head regular. The diſtance at which they ſhould be planted now, if there be a large number of them, is eight feet row from row, and ſix feet aſunder in the rows.

The gardeners around London, who raiſe great qnantities of theſe buſhes in order to ſupply the markets with their fruit, prune them ſoon after Michaelmas, and then dig up the ground in the abovementioned intermediate ſpaces, and plant it with coleworts for ſpring uſe. Their ground is by this means employed all the winter, without hurting the gooſberries; and the coleworts ſo planted often eſcape in hard froſts, when others which are leſs ſheltered are often deſtroyed. This huſbandry is well worth practiſing where land is dear, or where perſons are confined for room.

The common practice of clipping the heads of theſe ſhrubs with ſhears, in order to give them a roundiſh form, is very wrong: becauſe they become thereby ſo crowded with wood, that the fruit which they do produce never grows then to half the ſize that it would if the branches were properly thinned with a pruning knife, all the miſplaced ones cut away, and the ſtrong bearing ſhoots ſhortened to about ten inches, with care always to prune them off behind a leaf bud. With this management, with keeping the ground clear from weeds, with digging it at leaſt once a year, and with beſtowing a little rotten dung upon it every other year, the fruit will be near twice as large as that which is raiſed in the common way, and the ſhrubs will continue in vigour much longer.

The large white Dutch, the large amber, the early red, and the early green, both of which laſt are hairy, are generally reckoned the beſt ſorts of gooſberries: but many others, nominated from the perſons who have raiſed them from ſeeds, ſuch as, Lowe's gooſberry, Lamb's gooſberry, Hunt's gooſberry, Edwards's gooſbery, and many ſtill newer varieties, which have been obtained by the ſame means, and which it would be needleſs to enumerate here, alſo much eſteemed.

*Raſberries* are of three ſorts; the common wild one, the large red garden raſberry, which is one of the pleaſanteſt of fruits, and the white, which is little inferior to the red. All of them ripen about the beginning of July.

Theſe plants are generally propagated by ſlips, or ſuckers, but layers are far preferable, becauſe they will be much better rooted. Their fibres ſhould be ſhortened when they are tranſplanted; but the buds which are placed at a ſmall diſtance from the ſtem of the plant muſt not be cut off, becauſe they produce the new ſhoots the following ſummer. A freſh ſtrong loam, in a ſhady ſituation (Mr. Mortimer ſays[a], even under a north wall,) is that in which they thrive beſt, and produce the faireſt fruit, eſpecially if they are planted two feet aſunder every way, in borders of a moderate breadth; for if there be not room for the air to paſs freely between them, they never produce their fruit in ſo great quantity, nor does it grow ſo large, or ripen ſo kindly, as when they ſtand at ſufficient diſtances from each other. To promote this, they muſt be kept very clear from weeds; and to let the ſun in among them to ripen their fruit, their heads are cut off, juſt above the bearing part, a fortnight or three weeks before the fruit begins to ripen. It is upon this principle that Mr. Miller adviſes [b] ſetting them about two feet aſunder in the rows, and leaving a ſpace of four or five feet between row and row. March is the uſual time for planting them.

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[a] *Art of Huſbandry, Vol.* II. Art. RASBERRIES.

When they are dreſſed, the ſeaſon for which is in October, all the old wood, which produced fruit the preceding ſummer, ſhould be cut down below the ſurface of the ground, and the young ſhoots of the ſame year muſt be ſhortened to the length of about two feet. The intervals between the rows ſhould then be well dug, to lay freſh earth to the roots; and if a very little rotten dung is buried therein, the plants will ſhoot the more vigorouſly in the following ſummer, and produce the finer fruit. During the ſummer, they will require no other culture than keeping them clear from weeds.

Theſe plantations ſhould be renewed every third or fourth year; after that, their fruit dwindles greatly, both in quality and in quantity.

*Strawberries*, with which I ſhall cloſe my account of garden fruits (though theſe do not ſtrictly come under the title of this Article), thrive beſt, and bear moſt plentifully, on a light and moiſt hazely loam, not over rich. They may be raiſed from ſeeds; for by that means it is that we have obtained the ſcarlet ſtrawberry, which is a native of Virginia; the hautboy, originally an American plant; and the Chili ſtrawberry, which was firſt brought into Europe by M. Frezier, a French engineer: but the common, and moſt expeditious way of propagating them is from their runners, which eaſily take root at their joints, and there form plants, which, in two or three months, are fit to be cut off and tranſplanted. Thoſe which root earlieſt in the ſpring, and neareſt to the mother plant, are the fitteſt for this purpoſe: and the beſt time for removing them is in October, that they may get new roots before the hard froſt ſets in. They ſhould never be taken from old neglected beds, where the plants have been ſuffered to run into a multitude of ſuckers, nor from any but the moſt fruitful plants.

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[b] *Gardener's Dict.* Art. RUBUS.

The ground in which they are planted muſt be well dug, and very carefully cleared of weeds; and when it is levelled. it ſhould be marked out into beds three feet and an half, or at moſt four feet wide, leaving a path way of two feet, or two feet and an half broad between them. Theſe paths are neceſſary for the convenience of gathering the fruit, for weeding and dreſſing of the beds, and, which is of eſſential conſequence to plants that remain ſo long in the ground as theſe do, to be frequently dug up, in order to lay fine freſh earth to the roots of the plants. Of the wood ſtrawberry, which is a native of this iſland, but of the ſmalleſt growth of any, though greatly improved, both as to ſize and flavour, by culture in the garden, four rows may be planted, in a quincunx order, at about eight inches from each other in the rows, and a foot diſtance from row to row, in beds that are four feet wide: but three rows in a bed three feet wide will do much better, becauſe theſe will be more benefited by the digging of the alleys. The ſcarlet ſtrawberry muſt be planted at a foot diſtance every way, and the hautboy at ſixteen inches. The Chili ſtrawberry, which is the largeſt of all, muſt be ſet at about two feet diſtant from plant to plant. This laſt is found to ſucceed beſt under the ſhade of trees, in a very ſtrong brick earth, approaching nearly to clay: but it ſeldom perfects it's fruit here, ſo as to anſwer the trouble of cultivation. In Chili, where it grows wild, the fruit of the larger ſorts (for there are two kinds, but neither of them fit for the open air in this country) is as big as a walnut, but not ſo well taſted as our own ſtrawberries.

If the winter prove ſevere, ſome old tanner's bark, or if that cannot be eaſily procured, ſawduſt, ſea coal aſhes, or decayed leaves of trees, ſhould be ſpread over the ſurface of the bed, between the plants, to keep out the froſt. This care is abſolutely neceſſary to the Chili ſtrawberry, which is frequently killed in hard winters.

In the ſpring, after the danger of hard froſt is over, the ground between the plants in the beds ſhould be forked with a narrow three pronged fork, to looſen it and break the clods: and if the tan, or other covering, which was laid on in the autumn, is then mixed with and buried in the earth, it will be of ſervice to the plants, eſpecially in ſtrong land. A covering of moſs ſpread over the beds about the latter end of March, or the beginning of April, will not only keep the ground moiſt, by preventing the drying winds of the ſpring from penetrating it, and thereby contribute greatly to ſecure a good crop of fruit; but it will alſo preſerve the fruit clean from that grit which is often thrown up by heavy rains after it is full grown, to the great detriment of it's flavour, becauſe it muſt then be waſhed before it can be eaten.

When the plants begin to flower, they muſt be watered very plentifully if the ſeaſon is dry, and great care muſt be taken to keep them clear from weeds. At Michaelmas, the beds ſhould be forked again, the weeding ſhould be repeated carefully, the alleys ſhould be dug, and the weeds buried in them, all the ſtrings or runners muſt be taken from the roots, and the plants ſhould be thinned, by pulling up the weakeſt, wherever they ſtand too cloſe together. The throwing of a little fine earth over them, at that time, will alſo greatly ſtrengthen their roots.

As theſe beds ſeldom continue good above three years, in the common way of managing them (though Mr. Miller, with greater care and judgment than is uſually exerted, has made them remain in perfection four or five years), and as they yield but little fruit the firſt year; it is neceſſary to new plant ſome freſh ground every third year. When this is done, the old beds may be deſtroyed, and the ground converted to ſome other uſe, after the new ones have had one year's growth. But that ſtrawberry beds may be made to yield good crops even for ſome years longer than the abovementioned uſual term of their duration, is perhaps more than probable, if they are cultivated according to the principles of what is called the new huſbandry.

The excellent M. de Chateauvieux, among his numerous and judicious trials of that huſbandry, upon different plants, applied it to ſtrawberries, of which he planted ſeveral beds of well and deeply looſened earth, ſix feet wide, with ſingle rows. The vigour of the plants, the largeneſs of their leaves, and the very great number of their roots, though cultivated only by ſtirring of the ground with the horſe-hoe, without the leaſt help of dung, manure of any kind, or watering even in the drieſt weather, gave him room to expect, before the firſt ſummer was over, that their fruit would be very large and plentiful the next year: nor was he diſappointed; for in 1754, which was their ſecond year, his "ſtrawberries were admirable, "extremely large, finely ſcented, and of a very high "flavour[c]." He continued the ſame method in 1755 and 1756, and with the ſame ſucceſs as before. In ſhort, though the year 1755 was ſo extremely hot and dry, that no watering could well ſuffice to keep alive the plants that were managed in the common way; theſe remained conſtantly green, and in great vigour, and their fruit was, in every reſpect, finer than that on which the utmoſt care was beſtowed in his kitchen garden[d]. Unfortunately for the public, M. Duhamel's account of that gentleman's intereſting experiments comes no lower down than the year 1756: but I am not without hopes of obtaining from their illuſtrious author a copy of the obſervations which he may have made ſince that time. They cannot but be highly valuable: and if I ſhould be favoured with them, I ſhall think it my duty to communicate them to my countrymen.

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[c] Duhamel, *Culture des Terres, Tom.* IV. *p.* 455.

## SECT. III.

### OF THE ORCHARD.

THE beſt ſituation for an Orchard is a gently riſing ground, open to the ſouth-eaſt, and defended from the weſt, north, and eaſt winds, by ſomewhat diſtant hills, buildings, or plantations of tall trees. If theſe laſt do not offer naturally, they muſt be procured by art. A great declivity is by no means proper for an orchard, becauſe heavy rains frequently waſh down the fineſt part of the ſoil there, and of courſe leave the trees deſtitute of their neceſſary nouriſhment: but on a moderate ſlope, eſpecially towards the ſouth-eaſt, they enjoy among other advantages, the eſſential one of being moſt effectually cleared, by the ſun and air, from fogs and damps, which would do them great injury if ſuffered to ſtagnate among them.

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[d] *Id. ibid. Tom.* V. *p.* 544.

The ſoil of the orchard ſhould be richer than that from whence the trees are taken, though, (which will depend on the forming of the nurſery accordingly,) as nearly as may be, of the ſame nature; and it ſhould be deeper than is uſually deemed neceſſary for the kitchen garden. If it be paſture ground, or otherwiſe covered with turf, the ſward ſhould be plowed up in the ſpring before the trees are to be planted, ſo that it may have at leaſt one ſummer's fallow, during which it ſhould be well ſtirred and turned two or three times, to break the clods, rot the ſward, and prevent the growth of weeds: but two years of this management, in the courſe of which it will likewiſe reap the benefit of the winter's froſts, will, together with frequent deep plowing, render it ſtill more completely looſe and mellow. Then will alſo be the time to uſe whatever manure may be requiſite, in order to correct it's defects, and fit it for the reception of the intended plants. At the Michaelmas immediately before planting, it ſhould be plowed again (or rather dug), likewiſe pretty deep, to looſen it once more thoroughly, and the trees deſigned for it ſhould be planted in October, if the ground be dry; but in the beginning of March, if it be wet.

Care ſhould be taken to ſuit the quality of the ground as nearly as poſſible to the nature of the trees intended to be planted in it; according to the hints before given: for it is owing to a neglect of this important caution that numbers of orchards, in moſt countries, never arrive to any tolerable degree of perfection; but their ſickly trees, half ſtarved for want of nouriſhment, are either over-run with moſs, or their bark cracks and divides; both of which are evident ſigns of their weakneſs: whereas, if the very ſame orchard, for example, which is injudiciouſly planted with apples, had been planted with pears, cherries, or any other fruit better adapted to the ſoil, the trees might have flouriſhed well, and have yielded plentiful crops of fruit. For the ſame reaſon, many different ſorts of fruit ſhould not be planted together in the ſame orchard, as is the practice of ſome, who mix them alternately: for beſides it's being impoſſible for them all then to have an equally proper earth to grow in, there will be ſuch difference in the ſize or the trees, as will not only render them unſightly, but alſo the fruit upon the lower trees, perpetually overſhadowed by the higher, will not ripen well, nor, of courſe, acquire a good flavour. He therefore, who is determined to plant ſeveral ſorts of fruit on the ſame ſpot, though this is by no means adviſeable, unleſs it be, perhaps, upon a rich and pretty ſtrong loam (for that is the ſoil in which the greateſt number of different ſorts of fruit trees will thrive beſt), ſhould obſerve to plant the largeſt growing trees backward towards the north, and proceed gradually towards the ſouth, with thoſe of leſſer growth. By this means the whole plantation will have a regular ſlope, and the ſun and air will more eaſily paſs through it, and diſpenſe their benefit to every tree. This, and their ſtanding ſufficiently diſtant from each other, are the ſureſt means of preſerving them from the bad effects which would otherwiſe enſue if the damp vapour of their own perſpiration, and the exhalations of the earth mixed therewith, were pent in among them: for theſe, beſides injuring the growth of the trees themſelves, are imbibed by the fruit, of which they then render the juices crude and unwholeſome, and ſpoil the taſte.

The manner of tranſplanting fruit trees from the nurſery, and of training them for ſtandards, and conſequently to be fit for the orchard, having been already given, together with the time when, and the age at which, it is beſt to remove them, and alſo directions for pruning them when grown up[e]; I am now to obſerve, that the diſtances at which they are here ſet ſhould be proportioned to the extent of the moſt vigorous growth of each particular ſort. About ſixty feet will be ſufficient for the largeſt, in an incloſed orchard, and about thirty will be enough for the ſmalleſt. The quincunx order is the beſt form to ſet them in.

When the trees are planted, (the orchard being previouſly well fenced in,) they ſhould be tied up to ſtakes to prevent their being blown out of the ground, or diſplaced, by high winds; and if the ſeaſon ſhould prove dry in the following ſpring, the expence of watering them may be ſaved, in a great meaſure at leaſt, if not wholly, by covering the ſurface of the earth over their roots with green ſods, turned the graſs ſide downward. Theſe will prevent the ſun and wind from drying the ground, and will help to enrich it when they are dug in, as they may be gently after the firſt year; for the trees will then be out of danger, if they have taken well. Till then, and even till they are grown ſomewhat large, it will be right to give them a yet farther ſupport againſt the wind, and a defence from cattle, by ſetting round each of them, triangularly, three pretty tall and ſtrong ſcantlings of wood, (which are generally ſawn out for this purpoſe, but the thick ends of ſtrong poles may do,) faſtened together with two or three croſs bars on each ſide, and drawn pretty cloſe to each other at their top, where the ſtem of the tree, when it has paſſed their height, ſhould be wrapped round with a band of ſtraw, hay, or ſome other ſimilar ſoft ſubſtance, to prevent it's being galled by rubbing againſt them, and to keep it the more ſteady.

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[e] See the preceding *ARTICLES* I, II, III, and VI.

The intermediate ſpaces between the trees of the orchard thus planted may be ſown with graſs, corn, or kitchen vegetables, juſt as in an open field: ſo that there will not be any loſs of ground. The only cautions to be obſerved in this caſe are, not to dig or plow ſo deep as to tear the roots of the trees, and not to injure their ſtems with the ſcythe or ſickle. For theſe reaſons, and alſo that the goodneſs of the ſoil may not be too much exhauſted in the places where it's fertility is moſt immediately wanted, none of the additional crops ſhould be ſown quite cloſe to the trees, nor ſhould any large rooting plants, eſpecially weeds, be ſuffered to grow near them. A careful ſtirring of the ſurface of the ground about the roots of the trees, will do them great ſervice; and the oftener this is done, the better they will thrive, eſpecially if thoſe ſpots are at the ſame time properly manured.

The whole of the ſoil thus occupied muſt be mended every ſecond or third year with dung, or ſome other ſuitable manure, the expence of which will be amply repaid by it's double produce. And here I muſt obſerve, that, as the ground will yield it's uſual crops, and thoſe equally good, when it is likewiſe interperſed with fruit trees planted at ſufficient diſtances, ſuch for example as ſixty feet, at leaſt, for apples and pears, both of which will do beſt in the richeſt ſoils; I ſee no reaſon why this plantation ſhould be confined to the ſmall compaſs of what is commonly termed an orchard, nor why the intelligent huſbandman ſhould not reap the ſame advantage from all his fields, whether they be arable, or paſture. They will afford him, without much diminution of his other crops, ſuch plenty of all ſorts of fruit, for domeſtic uſes, for cyder, for perry, and for ſale, as will hardly be the leaſt profitable part of the reward of his induſtry, but, probably, by far the moſt conſiderable.

Even the parting fences in the farm are proper places for ſtandard fruit trees. Almoſt all the Kentiſh cherries [f], for example, the produce of which amounts to conſiderable ſums every year, are gathered from trees planted in hedges. Pear trees are raiſed in the ſame ſituation, to the no ſmall advantage of their owners, for perry; and if crabs are planted in the hedge rows, apples may be very properly, and very profitably, grafted on them, eſpecially for cyder. Beſides, the wood of the pear tree is valuable, as is alſo that of ſeveral thorny plums, (which are therefore well worth ſetting in theſe places), for the fineneſs of it's grain, it's colour, and the poliſh it will take: and ſo likewiſe is the timber of the black cherry tree, of the bird cherry tree, and of the Mahaleb, or perfumed cherry tree [g], all of which frequently grow to a ſize big enough for the uſe of cabinet makers, even for tables. The wood of the Mahaleb cherry is greatly eſteemed by the French, on account of it's agreeable odour, in conſequence of which they often paſs it off for the ſweet ſcented wood of the iſland of St. Lucia: but that of the bird cherry is yet better.

To ſave the expence of fencing each ſingle tree that is planted in the open ground, whether it be field or orchard, with poſts and rails, as before directed, and as is the common practice, or with hedges and buſhes, which muſt be renewed every other year; Mr. Evelyn recommends [h], upon his own experience, the following method, communicated to him by Dr. Beal, as an equally effectual, and much cheaper ſecurity againſt cattle.

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[f] This is the *Ceraſus ſativa rotunda rubra et acida* of C. Bauhin, P. 449.

[g] This is the *Ceraſus ſylveſtris amara, mahaleb putata*, of J. Bauhin.

Set your tree on the green ſward, or five or ſix inches under it if the ſoil be very healthy; but if it be moiſt or weeping, half a foot above it. then cut a trench round the tree, at the diſtance of two feet or more from it: lay a range of the turfs, with the graſs ſide outward, upon the inner ſide of the trench towards the tree, and then a ſecond range upon the former, and ſo to a third and fourth, all regularly placed, and leaning towards the tree, after the form of a pyramid, or large hop-hill. As each circle of ſods is thus placed, the interval between it and the tree muſt be filled up with the looſe earth of the ſecond ſpit that is dug out of the trench. This trench may be two feet and an half wide, or more, according to the intended height of the hillock, for which three feet will hardly be too much in this way of planting. At the top, it's diameter may be about eighteen inches, or two feet, and the earth there may be left in form of a ditch, to convey the rain towards the ſtem of the tree. Five or ſix ſmall briars or thorns ſtuck up around the ſummit of this, and bound lightly to the body of the plant, will compleat this work, from which our author deduces, among ſome others, the following advantages; *viz.* That neither ſwine, ſheep, or any other cattle, can annoy the trees thus planted; that when they are thus ſecured, they may be planted younger than might otherwiſe be proper in an open field; that they will reſiſt the violence of the wind, when they are fixed in theſe hillocks, without danger of being fretted, and thereby cankered, by ſtakes to ſupport them; that if the ſoil be wet, that inconvenience is hereby remedied in ſome meaſure; and that, if it be very dry, the hillock is a defence from the outward heat.

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[h] In his POMONA, c. 7.

By the ſecond or third year the trench (for the ſpace taken up by which the graſs upon the bank around the tree will make the farmer amends) will be nearly filled up again by the treading of cattle, if the ground be moiſt, or the ſeaſons wet. It will then be neceſſary to renew the fence of thorns; and if a little rich mould is thrown into the bottom of the trench, (for it ſhould not be cleanſed, like a ditch,) it will promote the growth of the trees, and invite their roots to ſpread.—Where the ſoil is not rich, the cleanſing of a frequented high-way, or of a yard where cattle are kept, will be of great ſervice to the trees around the roots of which it is laid in the trench. One load will be ſufficient for ſix or ſeven trees; and thoſe of apples, in particular, will be ſingularly benefited thereby.

Greater caution ſhould be uſed in the pruning of trees in orchards, or planted out in the field, than is neceſſary for thoſe in gardens; becauſe as the former ſtand at greater diſtances, and the plants under them are of leſs proportionable value, their branches may be permitted to extend wider, according to their natural growth, without reſtricting them to any particular form. By this means, (only cutting out the dead wood, and ſuch ſhoots as croſs one another,) they will not only be very fruitful, but alſo very long lived: for, as Mr. Evelyn obſerves in ſeveral parts of his moſt valuable work, there are few trees, even of the ſeemingly moſt periſhable kinds, which will not laſt for ages, if the murdering knife is but prudently withheld from them: for when that is uſed ſo much as to leave conſiderable parts of their maimed branches, eſpecially near the body, expoſed to all the inclemencies of the weather; the wet, which gets in there, often rots them to the very heart.

Some particular counties are famous for particular fruits, as Devonſhire for the red-ſtreak apple, Herefordſhire for the ſweeter ſorts, Worceſterſhire for the Turgovian and the Boſbury pears, &c. of which farther notice will be taken under the articles of Cyder and Perry. But I cannot help thinking that theſe diſtinctions are owing to want of attention in the huſbandman: for I ſee no ſort of reaſon why the red-ſtreak, for example, ſhould not grow in any other county as well as in Devonſhire, or why the ſweeter Cyders ſhould be peculiar to Herefordſhire. A ſimilar ſoil, and a ſimilar ſituation, will undoubtedly produce the ſame fruits in every part of England. Numerous are the inſtances of plants which have been brought even from the moſt different climates, and naturaliſed where they have been cultivated with due care. Thus the cherry tree, now ſo common all over Europe, was firſt brought from Aſia, by Lucullus, who carried it to Rome, from whence it ſpread, and reached Britain in the year of Chriſt 55[*]: and it is to equally foreign extractions that we owe moſt of our good fruits. The very grain which is now the chief ſupport of all the nations in Europe, was probably a native of the warmeſt parts of Africa; and, according to Pliny and Columella, lucerne, which now yields ſuch abundant crops in this kingdom, was originally brought into Europe by Xerxes, at the time of his expedition againſt the Greeks.

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[*] Lucullus is ſaid to have carried the cherry tree to Rome from Ceraſus, a city of Pontus, which he took, and deſtroyed, at the time of the Mithridatic victory, in the year of Rome 680. Conſequently, ſuppoſing this account to be true, (which the teſtimonies of the ancients leave us no room to doubt) and that it was then firſt planted in Italy, it found it's way hither about 120 years after. Whether it derived it's Latin name *Ceraſus* from the Greek city Κερασος, or whether that city took it's name from the great number of cherry trees which grew about it, is quite immaterial to us.

The *Cheſnut* tree, highly valuable for it's timber, which is equal to the very beſt oak in ſome reſpects, and ſuperior to it in others, is properly a foreſt tree, and will accordingly be treated uf as ſuch under that head. Where it is cultivated for it's fruit, as in Portugal and Spain, from whence we have the fineſt, it is raiſed from the nut planted in February, about four inches deep in freſh undunged earth, and is afterwards grafted and managed like other fruit trees: but this grafting, and the ſhortening of it's tap root when it is removed from the nurſery, which is uſually done after it has ſtood there three or four years, generally ſpoil it for a timber tree, by making it branch out too much. It's own leaves, if they are ſuffered to rot upon the ground, and are ſlightly dug into it in the ſpring, around the roots, but, as in the dreſſing of other trees, at ſome diſtance from the ſtem, will be a ſufficient manure. 'Tis pity that theſe leaves make ſo great a litter as they do: for otherwiſe the cheſnut tree would form delightful avenues, or ſmaller plantations near a dwelling houſe.

The *Wallnut* tree was formerly held in great eſteem in this country, for it's wood, which is, in fact, often very finely veined; but, on account of it's aptneſs to be worm-eaten it has of late given place to the beautiful and much ſounder mahogany, with which our cabinet makers have been pretty plentifully ſupplied from the Britiſh ſettlements in the Weſt Indies. As an uſeful fruit tree, independent of it's timber, which is, however, ſtill of good value, it merits the huſbandman's attention; nor can the gentleman eaſily find a more ſtately one to adorn his park with, or to form a noble avenue to his manſion.

These trees are raiſed from their nuts, which it is beſt to keep in dry ſand, with their outer covers on, till February; that being the right time for planting them. If they are intended for timber trees, in which light they will be farther conſidered when we come to treat expreſsly of that ſubject, they ſhould be ſown in the places where they are to remain, in order that the breaking or otherwiſe ſhortening of their roots. and eſpecially thoſe of the tap kind, may not ſtint their growth, and make them run out in branches: but if they are deſigned for fruit, their fertility will be increaſed by tranſplanting them, becauſe their downright roots, which are thoſe that chiefly encourage the luxuriant growth of wood in all ſorts of trees, will be thereby checked, and they will be made, in lieu of them, to ſtrike out numbers of lateral roots, which, as experience has proved, always conduce greatly to the production of the largeſt and faireſt fruit. The moſt proper ſeaſon for tranſplanting them is when their leaves begin to decay; and the beſt age, when they have had three or four years growth in the nurſery. Mr. Miller ſays[1] he has frequently experienced that there is little danger of their ſucceeding although they be eight or ten years old when they are tranſplanted: but, however that may be, it is certain that they will root beſt, grow largeſt, and laſt longeſt, if they are removed young. The leſs their branches are cut at the time of tranſplanting, or indeed at any time after, the better they will proſper; for much lopping often cauſes them to decay: but if there be a neceſſity for taking off any of their boughs, it ſhould be done early in September, that the wound may have time to heal before the cold and wet comes on. It is likewiſe eſſential to cut the branch off quite cloſe to the trunk, leſt the ſtump which is left ſhould decay, and rot the body of the tree; to prevent which, eſpecially if the wound be large, it will be right to ſmooth it well with the chiſſel, and then to cover it over carefully with a cement of clay or wax, as in the caſe of grafting, with a piece of tarpauling, or of ſheet lead, over that, in the manner before directed.

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[1] *Gardener's Dict.* Art. JUGLANS.

Theſe trees ſhould not be planted nearer together than forty feet, and more may be yet better, if they are deſigned for fruit. They delight in a firm, rich, loamy ſoil, or ſuch as is inclinable to chalk or marl; and they will thrive very well in ſtony ground, or on chalky hills, as is evident from thoſe large plantations near Leatherhead, Godſtone, and Carſhalton in Surry, where great numbers of theſe trees planted upon the downs produce annually large quantities of fruit, to the no ſmall advantage of their owners.

In order to preſerve this fruit, it ſhould be left upon the tree till it is thoroughly ripe, and then, as it would be exceedingly troubleſome to gather it by hand, it may be beaten off, but not with ſuch violence as is commonly uſed, from a miſtaken notion that the tree is improved thereby: for moſt certainly it cannot be benefited by that rough way of forcing off the young wood upon which this fruit grows. The nuts thus obtained ſhould be laid in heaps for two or three days, after which they ſhould be ſpread out, and when they have parted from their huſks, which they will then ſoon do, and have afterwards been well dried in the ſun, to remove the moiſture of their ſhells which would otherwiſe make them mould, they ſhould be laid up in a dry place, where neither mice nor other vermin can get at them. In this manner they will remain good for four or five months: or, which is a yet better way, and will keep them ſtill longer, let them, when their outward moiſture has been dried by the ſun, be put up in jars, or other cloſe veſſels, with dry ſand between their interſtices. The laying of them for four or five hours in an oven gently heated, as is the practice of ſome, will indeed dry the germ, and prevent their ſprouting: but if the oven is too hot, it will make the kernels ſhrink, and prevent their being peeled with any tolerable eaſe.

Were it only for the oil thar theſe nuts afford, the trees which produce them would be worth ſome care. Mr. Evelyn ſays[k] that one buſhel of them will yield fifteen pounds of peeled kernels, and that theſe will yield half that weight of oil, which the ſooner it is drawn, is the more in quantity, though the dryer the nut, the better in quality. He adds, that the lee, or marc of the preſſing, is excellent to fatten hogs with.—Certainly it would be good manure for land; as are the cakes of lin-ſeed, rape, &c. after the oil has been ſqueezed out of them. The green huſks boiled, without any mixture, make a good colour to dye a dark yellow. The kernel being rubbed upon any crack or chink of a leaking veſſel, ſtops it better than either clay, pitch, or wax.

The French are very fond of the kernels of theſe nuts ſcooped out of the ſhells before they are hardened, with a ſhort broad braſs knife; becauſe iron ruſts. When ſcooped out, they are ſteeped in ſalt and water for a few hours before they are ſet upon the table, as well to take off all taſte of bitterneſs, as to make them peel with the utmoſt eaſe. They call them *cerneaux:* and think them much wholſomer and more palatable when ſo prepared, than when eaten older, harder, and drier.

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[k] *Diſcourſe of Foreſt Trees, c.* 8. § 4.

Though the fruit of the *Service* tree is not much eſteemed in England, it is often ſerved up to the table, as a part of the deſert, in the South of France, and in Italy, where there is no want of a variety of fine fruits. The ſpecies there is indeed much larger than ours[l]: but as Mr. Evelyn[m] has left us no room to doubt that our wilder ſort, which grows naturally in many parts of England, may, like all other plants, be greatly improved by due culture, it is well worth the huſbandman's while to give it a place in his orchard, or other ground. Mr. Miller too gives more than one inſtance of his having ſeen the ſervice tree brought to great perfection in this country[n]. He has obſerved three ſorts (Mr. Evelyn noted four) of our native growth, the fruit of one of which is ſhaped like a pear, and that of the other like an apple. The former, which reſembles moſt the foreign ſpecies abovementioned, is the beſt and the largeſt grower; for it will ſometimes attain to the height of near forty feet.

It is a common, but a very miſtaken ſaying, that the ſower of theſe trees never ſees the fruit of his labour. This notion may have ariſen from their bearing moſt plentifully when they are very old: but with proper care, they may be made to produce fruit in a few years, even from the time of raiſing them from their ſeeds; and if they are propagated by layers, or cuttings, they will ſoon begin to repay the pains beſtowed on them.

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[l] The former is C. Bauhin's *Sorbus ſativa*, cultivated Service, P. 451; and our's is the *Sorbus ſylveſtris, foliis domeſticæ ſimilis*, Wild Service, with leaves like the cultivated, of the ſame author, P. 415. This laſt is commonly called here Quicken, Quickbeam, Mountain Aſh, and in the North, Roan tree.

[m] *Diſcourſe of Foreſt Trees*, c. 10, §. 1.

[n] *Gardener's Dict.* Art. SORBUS.

To propagate them from their ſeeds, of which there are three in each berry, or chequer, as ſome call this fruit, the pulp ſhould be rubbed off clean, with dry ſand, ſoon after the fruit is ripe, and the ſeeds, which are of a hard ſtrong nature, ſhould then, according to Mr. Miller's directions [o], be ſown in pots, for the convenience of plunging theſe into a moderate hot bed in the ſpring, in order to forward their growth: for it will be ſufficient to ſhelter them under a common frame during the intermediate winter. When the plants are come up, they ſhould be kept clear from weeds, watered in dry weather, and expoſed to the open air: for a cloſe hot bed would then draw them up ſo weak as to ſpoil them; nor indeed is any thing more intended here by this method of raiſing them, than to make the ſeeds ſprout ſooner than they would do in the common open ground, which, that circumſtance excepted, will do equally well, as theſe plants are very far from being tender. About the middle of October, at which time their leaves will decay, they ſhould be taken out of the pots in the hot bed, and planted in the nurſery, in rows two feet aſunder, and a foot apart in the rows. A little mulch ſhould be laid upon the ſurface of the ground, over their roots, in the winter, to protect them from being injured by froſt before they have well taken root, and in the next ſpring the ground between them ſhould be dug, and the mulch buried therein, with care not to cut or injure their tender roots. With this management, and keeping them conſtantly clear from weeds, they will be fit in three or four years, according to their growth, to be tranſplanted into the places where they are to remain: but previous to this it will certainly be right to graft them, as Mr. Evelyn adviſes [p], for the greater improvement of their fruit. They take well either on their own ſpecies, or on the white thorn, the quince, or the medlar. The beſt ſeaſon for removing them from the nurſery is in October, or in the ſpring juſt before they begin to ſhoot; and the ſoil in which they thrive beſt, ſooneſt produce fruit, and laſt the longeſt, is a moiſt ſtrong ground, defended from cold wind. However, they will grow even in the moſt expoſed places, and thrive where few other trees will ſucceed; for they are extremely hardy. This renders them well worthy of the huſbandman's attention, as well for their timber (which will be ſpoken of hereafter) as for their fruit. This laſt makes a pretty appearance when ripe; but the black birds and thruſhes are ſo fond of it, that they devour all they can come at. A way, therefore, to draw theſe warbling ſongſters about an habitation, is to plant a quantity of theſe trees for that purpoſe. Like the medlar, this fruit muſt be kept till it is almoſt rotten, before it will be fit to eat.

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[o] *Gardener's Dict.* Art. SORBUS.

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[p] *Ubi ſupra.*

SECT. IV.

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### OF THE DISTEMPERS OF FRUIT TREES.

FRUIT trees are, like all other vegetables, ſubject to various diſtempers and caſualties, which affect their ſeveral parts, and deſtroy them, if they are not carefully prevented, or remedied in time. The chief cauſes of them are, too great luxuriancy of growth, too much poverty, injudicious cuttings, blights, inſects and other vermin; for as to the neceſſity of keeping them clear from weeds, eſpecially while they are young, that eſſential part of all huſbandry has already been ſo often and ſo ſtrongly inculcated, that there can be no occaſion to particulariſe it here.

To the means before directed for checking by proper pruning, that exceſs of vigour which makes a tree ſpread itſelf in wood, inſtead of producing fruit; I ſhall only add here, that the boring of a hole through the body of the tree has frequently been practiſed with good ſucceſs for this purpoſe; and ſo has the ſplitting of the roots, and putting a wedge or ſtone into the cleft. Either of theſe methods, which Mr. Worlidge mentions [p], will undoubtedly help to prevent a too exuberant riſe of the ſap.

Digging, plowing, or otherwiſe ſtirring and looſening of the earth about the roots of fruit trees, but with caution not to break or tear thoſe roots too much, adds greatly to the fertility of the trees, for which it cannot well be too often repeated. It was upon the ſame principle, which is the fundamental one of the new huſbandry, that the beſt cultivators among the ancient Romans were fond of practiſing, and have ſtrongly recommended, particularly for the Vine, in treating of which it will be farther noticed, what they call *ablaqueation*, that is, laying bare their roots juſt before the winter comes on, and leaving them expoſed to the air during that ſeaſon, with the earth thrown up all around, like a kind of diſh, to receive the rain. This has been done in England with great ſucceſs, for fruit trees which neither throve nor bore well; and the moſt proper time for uncovering of the roots here has been found to be about the beginning of November. When the mould is returned back into the hole, as it muſt be at the approach of ſpring, beſides it's having been then mellowed and improved by the influences of the winter, it ſhould be mixed with ſuch manures or other corrective as is beſt ſuited to the nature of the tree and of the ſoil.

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[p] *Syſtema Agriculturæ*, c. 7. §. 11.

It is chiefly, if not wholly, owing to the want of due culture of the ground about the roots of trees, that we ſee ſo many of them over-run with moſs, to their very great injury, eſpecially when they begin to be old. Moſſes are perfect plants, the roots of which, when they grow upon trees, pierce through the bark, and draw their nouriſhment from that at firſt ſoft mucilaginous ſubſtance under the bark, which afterwards becomes wood. By this means the increaſe of the tree is prevented in that part, ſo that it becomes of an unequal ſize; and probably the juices in general may be vitiated. Whether this is the caſe, or whether the ſeed of the moſs takes root only on diſtempered trees, is not well aſcertained. The latter ſeems the moſt probable; becauſe the bark of healthy trees is ſo firm, and generally ſo ſmooth, that it will not afford lodgment to the ſeed. But however that may be; when moſs is actually ſettled upon a tree, the huſbandman muſt endeavour to get rid of it. To this end, when he prunes his trees, and does whatever elſe is neceſſary about them, in the winter, he ſhould moſt carefully ſcrape and rub off every veſtige of moſs, even from ſuch trees as are already ſo far decayed as not to merit any attention on their account, in order to prevent the ſeeds being carried to other trees; for it is ſo extremely ſmall, that the leaſt breath of air will waft it about. For this reaſon too, all the moſs that has been ſcraped off ſhould be carried away, or burnt, as Mr. Miller adviſes, that none of it's ſeed may be left. He alſo, very rightly, enjoins thorough and frequent ſtirring of the ground about the trees, not only as the moſt effectual way to guard againſt the growth of moſs, but likewiſe as the only one by which, together with lopping off ſome of the branches, in order to invigorate the reſt, it's return can be prevented [q]. A forcing pump will beat great part of the moſs off from the upper parts of a high tree, by the violence with which it protrudes the water; and the remainder will yield the more eaſily to the ſcraper and rubber after it has been ſoaked with wet. If the ſcraper is ſomewhat curved, it will the better encompaſs the branches of the tree; and if it is of hard wood, it will be leſs apt to injure the bark of the tree, than if it were of iron. The rubber muſt be a piece of coarſe linnen, or hair cloth. Where the quantity of moſs is but ſmall, for the prudent manager will not ever ſuffer it to ſpread, it may be ſcraped or rubbed off, after a ſhower of rain. —Mr. Mortimer ſays [r] he knew a perſon who had an apple tree very much over-run with moſs, and that he cured it by making around it a ſtye in which he fatted hogs.

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[q] *Gardener's Dict.* Art. Muscus.

[r] *Art of Huſbandry. Vol.* II. *p.* 315.

The ſame author inſtances [*], as a farther proof of the efficacy of ſwine's dung when it is uſed for manuring of fruit trees, a gentleman near Hereford, who fed ſeveral hogs about ſome old apple trees which he thought had done bearing, and had the next year thirty buſhels of apples, apiece, off from many of them. From hence he is induced to think that a moveable ſtye, made with hurdles, and removed from one tree to another as occaſion may require, will be a very great improvement of all ſorts of fruit trees, not only to promote their bearing, but likewiſe to cure them of the moſs, canker and other infirmities; eſpecially as this way will ſave the urine, which he prefers for trees much before dung, becauſe it penetrates better to the roots, and is perhaps a yet more effectual cure for the abovementioned diſtempers.

That urine is a very beneficial manure for fruit trees, as well as for other vegetables, and that it may be ſucceſsfully applied, in moderate quantities, to the body and branches of the tree, to cure cankers, and kill moſs and worms, is confirmed by Mr. Hartlib, Sir Hugh Plat, Dr. Plot, and others: but it does beſt when ſo ſtale as to have loſt it's fiery particles; and for the ſame reaſon dung ſhould not be applied to fruit trees before it is thoroughly rotten and has entirely loſt it's heat. The beſt ſeaſon for uſing the urine, to waſh the diſtempered trees with, is in March, in the courſe of which month the operation ſhould be repeated at leaſt two or three times.

The canker in fruit trees is moſt commonly occaſioned by wet, which gets in at the cleft where the tree was grafted, or at ſome other wound which has been neglected: but it alſo proceeds ſometimes from the ſoil's not agreeing with the nature of the tree.

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[*] *Art of Huſbandry. Vol.* II. *p.* 319.

If this diſtemper be only ſuperficial, ariſing from a bruiſe, for example, which the bark may have received, it may be cured by cutting the injured part out with a ſharp knife, and then binding over it a mixture of cow dung and earth, tied on with a wiſp of hay likewiſe daubed with cow dung. This muſt be done before the ſap begins to riſe: for otherwiſe the bark will peel, looſen, and wither much farther than the bruiſe, to the great hazard of the whole tree, eſpecially if the ſtem be the part affected [t]; for as to a bruiſed branch, the beſt way is to lop it off at once, if there be the leaſt ſuſpicion of danger. But when the canker has been bred in the tree, or when it has extended from the trunk to the branches, or from the branches to the trunk, ſo that after cutting away to the very quick there ſtill remains an eye, or ſpeck (like that which is ſometimes ſeen to run through a whole plant of diſtempered corn), the ſhorteſt way is, to commit the tree to the fire, and to plant another in it's ſtead. Mr. Nourſe is indeed inclined to think that [u], if the canker has not penetrated too far, the tree or ſtock, ſuppoſing it to be of the apple kind, may poſſibly be ſaved, by regrafting it with a winter Quinnin, a Boderan crab, a Boon apple, or a golden pippen; neither of which he had obſerved ever to canker; but how accurate his obſervations may have been in that reſpect, I ſhall not pretend to determine. Certainly it may be worth while to try a change of fruit in all ſuch caſes, if they are not abſolutely deſperate. He aſſerts, upon his own experience [x], that the apple which we call a Woodcock, is no way apt to canker, or to be blaſted. This, if it be fact, renders it by ſo much the more worthy of cultivation, as it is a great and conſtant bearer, and yields an excellent juice. The misfortune is here, as well as in the attempts which have been made to ſuit the ſoil and the fruit, that each of theſe is diſtinguiſhed, either by ſuch general appellations and deſcriptions as ſerve only to puzzle the huſbandman when he comes to real practice, or by names which are not known out of the places where they are uſed. Dr. Cullen will render a great ſervice to mankind, if he ſhould happily ſucceed in that important point, which, if I am rightly informed, is the object of his preſent ſtudies; *viz.* to aſcertain by an exact analyſis, which no one can be better qualified to do with the utmoſt preciſion, what are the component particles of each different ſpecies of ſoil, and in what proportion they are to each other. This, diveſted of that parade of ſcience, and of ſcientific terms, which the learned are too apt to diſplay, and which ſerves only to embarraſs common underſtandings, will, (ſhould ſuch a work appear, as it is hoped that it will ſoon,) anſwer a very eſſential purpoſe in agriculture, as well as lay a fine foundation for uſeful entertainment to gentlemen whoſe leiſure permits them to proſecute ſuch ſtudies. But the task, conſidered in all it's various branches, is arduous indeed! worthy of that able phyſician (I uſe the word here in it's moſt extenſive and moſt proper meaning) and ſkilful chemiſt, whoſe love for the welfare of mankind has prompted him to undertake it.

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[t] Nourse's *Diſcourſe of the Benefits and Improvements of Huſbandry*, p. 138. [u] *Ibid. p.* 139. [x] *Ibid.*

Mr. Worlidge aſſures us [y], that he himſelf cured a tree deſperately diſeaſed with the canker, by cutting off as many as he could of the cankery boughs, laying it's roots bare during all the winter and applying to them in the ſpring a great quantity of ſwines dung (not too new) mixed with the earth which was then returned into it's former hole. If this does not do, he condemns the tree to be grubbed up, as being paſt recovery.

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[y] *Syſtema Agriculturæ*, c. 7. §. 11.

The remedy for a tree which is bark bound, and therefore does not thrive well, is, to ſlit it's bark, with a knife, down the body of the tree, in April or May [z].

Some trees are hurt by ſmall worms which breed between the bark and the wood, and make the bark ſwell. Mr. Worlidge deſtroys them, by cutting away part of the bark, and waſhing the tree with urine and cow dung [a].

The heavens are often blamed for blights which are cauſed by the huſbandman's own neglect: for were he but ſufficiently attentive to clear his trees of every veſtige of caterpillars, and of their neſts of former years; the wind, ſo unjuſtly accuſed, would be found to be that beneficent ventilator which the bountiful Author of Nature intended they ſhould be. They only favour the vivifying of thoſe eggs which remain from the preceding year. No care ſhould therefore be ſpared to clear the trees of all caterpillars the moment they appear, and to deſtroy their eggs with all poſſible diligence: for, as we have ſeen moſt remarkably in the moth which deſolates the province of Angoumois [z], all theſe inſects multiply with aſtoniſhing rapidity. The labour, great at firſt, will decreaſe yearly under the hands of an attentive huſbandman, who will pluck off all their webs, or neſts, as ſoon as he perceives them, then burn thoſe neſts, with the eggs in them, and cleanſe thoroughly the parts of the tree where they were, by waſhing them with a ſtrong lye, and rubbing them well with a hard bruſh, as before adviſed[c]: for the common method of burning ſtraw, or brimſtone, under them, is not near ſo effectual as this.

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[z] *Id. ibid.* [a] *Ibid.*

[b] See *Vol.* III. *p.* 45. *et ſeqq.*

When caterpillars lay their eggs on the leaves of trees, as they often do in very great numbers, they pierce the outer ſkin of the leaf, and then depoſit under it their eggs, which are from that time fed by the juices that ſhould circulate to promote the vegetation of the plant: ſo that they then become doubly deſtructive. M. de Rèaumur has treated this intereſting ſubject in ſo maſterly a manner, that I am ſorry the bounds of this work permit me only to refer the curious reader to his moſt accurate and ingenious account of Inſects.

It is a moſt excellent contrivance which Mr. Bradley mentions[d] his having learnt from a gentleman of Hertfordſhire, to defend fruit trees from the ravages of ſnails, ſlugs, caterpillars, and all other creeping vermin. After obſerving, that the laying of tobacco-duſt, ſoot, ſaw-duſt, barley, chaff, &c. about the ſtems of the plants, affords but a very ſhort protection, for the firſt ſhower of rain demoliſhes it, and that tar put upon them is dried up by a few warm days; he directs, to wrap about the ſtem of a tree two or three rounds of ſuch line or rope, made of horſe-hair, as is commonly uſed to hang cloths upon; for this is ſo full of ſtubs and ſtraggling points of the hair, that none of theſe ſlow crawling creatures can paſs over it, without wounding themſelves to death. The head of a ſtandard can therefore receive no harm from them, if the bottom of it's ſtem is thus ſecured: but the ſheltering of a wall tree requires a little more caution, for beſides preventing their paſſage up the ſtem, one of theſe ropes muſt be faſtened cloſe to the wall, ſo as to incloſe all the branches of the tree, and allow ſpace enough to nail up the ſummer ſhoots within the compaſs of the hair line, which may eaſily be ſo diſpoſed, by giving it a couple of turns round the ſpace occupied by the tree, as to be enlarged to whatever breadth may be requiſite. The ſame rope will laſt ſeveral years.—In eſpaliers of fruit trees, it is only neceſſary to wrap theſe hair lines round the ſtems of the trees, near the roots, and about the bottom of every ſtake. This work ſhould be done in the winter, when the ſnails are laid up in their cloſe quarters.—The ſame means may be uſed to defend all ſorts of garden plants, by faſtening the hair lines around the edges of the beds in which they are to grow. The beſt lines for this purpoſe are thoſe that are made of the ſhorteſt hair; for they are fulleſt of points, and therefore moſt completely armed againſt any attempts of theſe pernicious vermin.

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[c] *Ibid. p.* 91.

[d] *Gentleman's and Gardener's Kalendar*, Art. April.

A very hurtful blight frequently ariſes in the ſpring from cold winds and froſts, which, eſpecially if they come on ſuddenly after the weather has been ſomewhat warm, ſtop the circulation in the tender buds, and thereby kill them. The only method yet diſcovered in ſome meaſure to ſhelter wall-trees from this miſchief, for I ſee not how it can be ſo eaſily applied to others, is, to cover the walls carefully with mats, canvas, reeds, or any ſuch like defence, which, being faſtened ſo as not to be diſturbed by the wind, will afford good ſhelter during the night, and, if the weather permits, may be removed in the day, as indeed it ſhould be, in order to avoid rendering the young ſhoots and leaves too tender to bear the open air, when they are afterwards expoſed to it; for that would be the caſe, if they were to be kept covered in this manner for any length of time. If theſe coverings are fixed near the upper part of the wall, and are faſtened to pullies, ſo as to be drawn up, or let down, they will be managed with very little trouble.

Theſe ſcreens may likewiſe anſwer another purpoſe, of a quite different nature from the foregoing, *viz* to prevent the too early bloſſoming of the finer fruits, by covering the trees with them in the day time, when the warmth of the ſun might perhaps ſwell their buds too ſoon in the ſeaſon, and taking them off at night, to give a farther check to the riſing ſap. By this means the danger of their too early bloſſoming, which is the great thing to be to feared, will, in ſome meaſure, be obviated.

As to that exceſſively pernicious blight which is called a fire-blaſt, and on the cauſe of which Mr. Miller reaſons[e] ſo very profoundly as, I muſt confeſs, greatly to ſurpaſs my underſtanding; I ſhall only obſerve, with him, that it ſometimes happens very late in the ſpring, and even in the month of May; and that it has often deſtroyed the fruit, leaves, and parts of trees, and ſometimes even whole trees, in a few hours, in large orchards and open plantations, as well as in gardens, and againſt walls; nor have any means of guarding againſt it yet been found.—Columella tells us, indeed, that his uncle, who was a moſt diligent farmer in Bœtica, uſed to cover his vines with mats in the beginning of the dog-days; becauſe, during that ſeaſon, the country was ſubject to a ſcorching eaſterly wind, which, like a fiery vapour, burnt up the grapes if they were not covered. But it can hardly be practicable to apply any ſhelter of this kind, or of any other that is proper, to tall and ſpacious ſtandard trees planted at conſiderable diſtances from each other.

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[e] *Gardener's Dict.* Art. BLIGHTS.

The want of rain juſt at bloſſoming time often occaſions the dropping off of the bloſſoms, for want of ſap to nouriſh them, eſpecially in dry grounds; upon which Mr. Mortimer obſerves [f], that he had heard of ſome perſons in Eſſex, whoſe orchards were upon a dry ſoil, who, only by keeping their trees watered at that ſeaſon, had great quantities of fruit when the crops of all their neighbours failed: and of a gentleman whoſe orchard, ſituated on a ſloping ground which he had the conveniency of watering when he pleaſed, hardly ever failed to yield great plenty of fruit. In ſuch droughty ſeaſons, it will likewiſe be adviſable to water the tops of the trees with a forcing pump; for this will not only refreſh the leaves and bloſſoms, but alſo waſh off the eggs of inſects, which are generally depoſited on them in vaſt numbers in that ſort of weather.

Sir Hugh Plat ſays, that green cow dung and urine mixed together, and rubbed about the ſtems of trees, with a bruſh, once in two or three months, will prevent rabbits, hares, deer, &c. from gnawing off their bark: and Mr. Evelyn recommends [g] for the ſame purpoſe, human dung mixed with a little water, or urine, and lightly bruſhed on (but this muſt be renewed after every great rain); or, which may be ſomewhat cleanlier for the perſon that uſes it, and which rabbits and all cattle moſt abhor, to water or ſprinkle them with the liquor in which tanners have dreſſed their hides; or, to tie thumb-bands of hay or ſtraw round them as far as thoſe creatures can reach.

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[f] *Art of Huſbandry, Vol.* II. *p.* 313.

[g] *Diſcourſe of Foreſt Trees, c.* 27.

As a preſervative againſt all ſmall vermin, ſuch as ants, piſmires, &c. which often do very great miſchief to trees, the authors of the *Maiſon ruſtique* adviſe [h] to lay a little heap of haulm, ſtraw, or any kind of mulch, round the bottom of the tree at the beginning of winter, and to take it away and burn it early in the ſpring; by which means vaſt numbers of thoſe inſects, ſheltered there during the hard weather, will be deſtroyed with it.

No ſort of manure that is uſed for a tree ſhould ever be laid near to the ſtem, but always at a diſtance from it proportioned to the ſpreading of the roots, according to the age and long ſtanding of the tree.

When an orchard or other plantation is grown ſo old and decayed as to be no longer worth keeping up (though it will be a great while before that happens, if proper care be but taken of it), the beſt way is to plant the new trees in the intermediate ſpaces between the old ones, after preparing the ground as before directed; for they will not do ſo well if they are ſet in the very ſpots where the old ones grew.

## SECT. V.

### OF THE CULTURE OF THE VINE.

IT cannot be doubted but that the Romans, who brought agriculture to great perfection in this country, would at the ſame time introduce here the cultivation of Vineyards, which had long been an object of their greateſt attention in Italy, and which, as we find by their writers on huſbandry,

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[h] *Tom.* II. *Part.* 3. *Liv.* 6. *c.* 1.

dry, they had extended to the other northern provinces of their empire. They kept poſſeſſion of this iſland till the Chriſtian religion was eſtabliſhed in it, and till the formation of religious communities, who, tempted by the deliciouſneſs of the fruit, and by the amuſement which it afforded to men ſeparated from the buſy world, would undoubtedly preſerve the culture of the Vine; and this, in all probability, remained in their hands only, for ſome ages after, during the unſettled ſtate of the kingdom. The military ſpirit which ſo peculiarly diſtinguiſhed this nation after the Norman conqueſt, continued the practice of the common farming in the hands of the meaneſt of the people, who, during the feodal tenures, being hardly better than ſlaves, could have but little power, and yet leſs inclination, to attempt the raiſing of vineyards, which are neceſſarily attended with a conſiderable expence at firſt, and afford but a diſtant proſpect of profit. The religious houſes therefore ſtill retained to themſelves the more coſtly culture of the Vine; and with them it fell, at their diſſolution by king Henry the eighth: nor was it revived, till the more elegant taſte in gardening was introduced at the reſtoration; and then only as of a plant fit to add to the pleaſure of fruit gardens. This accounts for the quantity of lands which appear by antient records to have been allotted to the abbeys and monaſteries of this kingdom, for their vineyards.

It may perhaps be a queſtion, whether Vineyards can be brought to ſuch perfection, as to anſwer the expence neceſſarily attending them, in England, where the ſoil and climate are highly favourable to the production of corn, and rearing of cattle. Theſe, not only yield plenty of food and rayment for our own uſe, but, which we cannot

not ever expect from the vine, they alſo afford us the moſt conſiderable articles of our commerce with other nations.

Whatever may be the fate of vineyards in England, they may certainly be brought to perfection in our colonies; for the uſe of which I ſhall therefore make my account of the culture of the Vine as general as I can, the better to ſuit it to the ſeveral climates of North America.

Columella aſks his friend Publius Silvinus, "Who had written ſo fully and ſo accurately of the Vine before him?" and we may, with equal juſtice, aſk, Who has excelled him ſince? I ſhall therefore make him my chief guide in treating of this ſubject; and believe that his excellent inſtructions, together with the principal improvements of the moderns, which I ſhall endeavour to point out, as I ſhall alſo the circumſtances wherein, and the reaſons why, Mr. Miller differs from him, will be ſufficient to direct the intelligent huſbandman how to manage his vines.

## *ARTICLE* I.

### *Of the Situation and Soil proper for a Vineyard.*

THE Vine, ſays Columella[a], is, with good reaſon preferred to all other ſhrubs, not only for the ſweetneſs of its fruit, but alſo for the eaſe with which it anſwers the labour beſtowed upon it, almoſt in every country and every latitude in the world, except in the frozen or the torrid zones. It grows as happily in plains as upon hills, and thrives as well in a ſtrong ſoil, as in that which is looſe and open, alſo in land that is poor, as in that which is rich; and in a dry ſoil, as well as in that which is naturally moiſt. It alone beſt endures the intemperature of heat, cold, or ſtormy weather.

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[a] *De re ruſtica, Lib.* III. *c.* 1.

Nevertheleſs, it is of great importance that the quality of the vine be adapted to the condition of the country: for neither is the culture the ſame in every ſoil and climate, nor are all vines of the ſame kind. It is not eaſy to ſay which is the beſt; experience teaching us, that every country has it's own, which is more or leſs proper for it. A judicious huſbandman will however eaſily find, that that vine is proper for the plain, which bears fogs and hoar-froſt without being hurt; and for a hill, that which can bear drought and wind. He will plant in a rich and fertile ſoil, a ſlender vine, which does not bear plenty of fruit; in a ſtiff ſoil, one that makes ſtrong ſhoots and is covered with plenty of leaves; and in a looſe ſoil, one that makes but few ſhoots. He will find, that it is not proper to commit to a moiſt place a vine which bears tender and large grapes; nor to a dry place, a vine of a contrary quality.

The good huſbandman will alſo know, that the nature of the climate is of great conſequence; whether it be hot or cold, wet or dry, ſubject to hail and wind, or calm, clear, or cloudy. Two ſorts of vines are fit for a cold and cloudy ſituation, *viz.* either one which is early, and ripens it's fruit before the winter; or one of firm and hard grapes, which bloom in the midſt of fogs, and afterwards mellow with the cold and hoar-froſt, as other grapes do with warmth. Where wind and the ſtorms are frequent, the vines muſt take deep root and have hard grapes: where the ſituation is warm, they may be of more tender and more fruitful kinds. Vines whoſe grapes rot with rain and conſtant dews ſhould be planted in dry places; and thoſe in moiſt, which are hurt by drought. If any vines are planted in places ſubject to hail, it ſhould be thoſe which have large and ſtrong leaves; becauſe they will ſhelter the fruit. Where the ſky is uſually ſerene and fair, all ſorts of vines will grow: and thoſe may be planted to advantage, whoſe grapes fall quickly off.

Could we have the quality of the ſoil, the ſituation of the place, and the ſtate of the weather to our wiſhes; that ſoil ſhould be preferred, which is neither too ſtrong nor too looſe, but rather inclining to looſe; neither poor, nor exceeding rich, but rather fertile. The ſituation ſhould neither be a plain, nor ſteep, but yet on a riſing ground: it ſhould neither be wet nor dry, yet moderately moiſtened with dews: it ſhould neither have ſprings on the ſurface, nor at ſome depth in the earth; and yet it ſhould communicate to the vines a moiſture which is neither bitter nor ſalt; for either of theſe will vitiate the taſte of the wine, and give a ſcurfy rough coat to every plant that grows on ſuch land. The ſtate of the moiſture may be known, by diſſolving ſome of the earth in water. The vine does not proſper either in a frozen, or in a ſcorching hot climate; but it thrives beſt in a country that is rather warm than cold. It is hurt more by rain, than by dry weather, and proſpers better in a dry climate, than where rains are frequent. It delights in gentle and moderate gales, but is greatly damaged by ſtorms.

It is an obſervation of long ſtanding, that ground which has never been plowed, or had trees growing on it, is the beſt for a vineyard. All authors agree, that an old vineyard is the worſt of any for making a new plantation; becauſe the earth is entangled with the old roots of the vines matted together, poiſoned by their decay, and quite exhauſted by their long ſtanding. Wood-lands may be uſed, becauſe the roots of common trees and ſhrubs are eaſily extirpated. Where there is no un-plowed land, the next beſt is a corn field, free from trees, or where trees have not been planted thick.

The fitneſs of new ground for the vine may be judged of by the ſhoots of ſuch ſhrubs as grow naturally in it; for if they make thriving ſhoots, which have not a ragged or ſtinted appearance, the vine will flouriſh there. Of all ſoils, a black rich mould is the beſt for vines. Stones which crumble, or rot as it were, with the weather, being broken, and laid to the roots of the vines, retain a moiſture, cool them, and, by that means, are exceeding fit for nouriſhing them. For the ſame reaſon gravel, pebbles, and looſe ſtones are approved of, provided they be mixed with rich mould *: but if they are mixed with poor earth, they are bad. Flints are likewiſe very friendly to vines, if covered with a moderate depth of earth; becauſe, being cold, they retain the moiſture, and prevent the roots being parched up in the dog-days. The foot of mountains, which receive the earth waſhed down from their tops: or vallies, to which additions are made by the ſettling of rivers, which overflow them, are very proper for vineyards. A chalky bottom is fit for the vine; but clay, not excepting even that which approaches to marle or potter's clay, is very unfit; as is alſo coarſe hungry ſand. On mountains and riſing grounds, and on the ſides of hills, vines do not eaſily take firm root; but they yield wine of a laſting and excellent flavour. In moiſt and level places, vineyards are exceeding ſtrong; but they

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* Such is the ſoil of moſt of the vineyards of Beaune, Chablis, Tonnere, Auxerre, Coulange, and Champagne, according to the authors of the *Maiſon ruſtique*, (*Tom.* II. *Part* 3, *Liv.* 6. *c.* 1.) whoſe directions for the culture of vineyards, taken from the actual practice of Orleans, Champagne, and Burgundy, which are the three provinces of France moſt famous for their wines (for the French do not eſteem their Bourdeaux wines ſo much as we do) agree, in all eſſentials, with thoſe of Columella.

produce wine of a weak flat taſte, which does not keep long.

It may be eſtabliſhed as a general rule, to plant vineyards in cold countries ſo as to face the ſouth, and in warm countries facing the eaſt, unleſs they are ſubject to ſtorms from that quarter, in which caſe it is better that they face the north. In exceeding hot countries, ſuch for example as Egypt, it will be beſt to expoſe them to the north.

M. Miller ſays[b], that the beſt ſoil for a vineyard, in England, is that whoſe ſurface is a rich ſandy loam, and not above a foot and an half, or two feet deep, lying upon gravel or chalk; either of which bottoms is equally good for vines. If the ſoil is deep, or the bottom either a clay or ſtrong loam, it is by no means proper for this purpoſe: for though the vines may ſhoot vigorouſly, and produce a great quantity of grapes: yet we have not ſun to ripen them ſufficiently. If the ſoil is too deep, the roots of the vine will run to too great a depth to receive the influences of the ſun and air; whence the juices of their fruit will be crude.

According to him, our vineyards ſhould be planted on the north ſide of a river, upon an elevation inclined to the ſouth, with a very gradual deſcent, that the ſuperfluous moiſture may be the better drained off. Yet if the ground ſlopes too much, it is by no means proper for this purpoſe. Hills to the north, as they ſhelter the vineyard from cold, and reflect the heat, will be of great advantage. The country round about ſhould be open and hilly, to preſerve the air dry. The vineyard ſhould be open to the eaſt, that it may enjoy the morning ſun, to dry up the ſuperfluous moiſture.

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[b] *Gardener's Dict.* Art. VITIS.

Dr. Beal, in Nº. 116 of the Philoſophical Tranſactions, after having mentioned ſome inſtances of the warmth ariſing from ſtones under ground, eſpecially lime-ſtone, and ſome kinds of pebbles, is of opinion, that, as I obſerved before [c] (quoting this very paſſage more at large), many of our hills and rocks might be greatly improved: for it would be no hard taſk, ſays he, to ſhovel down the ſhallow and moſſy turf from the ſteepeſt declivities, into places where it may have ſome receptable or ſtay; and there to impregnate it, with the ſpade and compoſt, for garden or vineyard.

## *ARTICLE* II.

### *Of preparing the ground for a Vineyard.*

THE ground muſt firſt of all be cleared of the roots of trees or ſhrubs, or whatever elſe can be a hinderance to the diggers, or might afterward preſs down the trenched earth, by it's weight, or by the treading of thoſe employed in carrying it off. It is of great importance that the earth be kept extremely looſe, even, if poſſible, without a foot touching it, in order that the mould, being all equally ſtirred, may eaſily give way to the young tender roots, where-ever they extend themſelves, and inſtead of obſtructing them by it's hardneſs, receive them into it's tender nouriſhing boſom, which, in that ſtate readily admits the ſhowers and other influences from above, and diſpenſes them equally to all parts, for the nouriſhment of the young plants.

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[c] *Page* 7.

A plain or valley muſt be trenched two feet and an half deep, and a riſing ground three. A ſteeper hill muſt be trenched four feet deep: for when the mould is turned down from a higher place, it can hardly be thrown up again to a ſufficient depth, unleſs the trenches are made deeper. Beſides, I never approve, ſays Columella[d], of planting a vine leſs than two feet deep, even in a valley; for it is better not to plant it all, than to leave it's roots too near the ſurface, ſuſpended from the nouriſhing moiſture which lies low, except where ſprings riſe near the ſurface: there indeed the ground muſt not be trenched above a foot and an half deep.

The trenches muſt be made equally deep all the way to the bottom, the ſides being perpendicular, and the ground marked out by a line, which muſt be carried forward as the work proceeds, always at equal diſtances, till the whole ground is equally trenched. Where the bottom is of a binding nature, it is of great advantage to lay in the bottom of the trenches, ſmall ſtones, or other rubbiſh, to carry off the water, which otherwiſe, ſtagnating there, would chill the tender roots. In order to do this the more effectually, the bottoms of the trenches are made ſomewhat convex towards the middle, the better to convey the water to drains cut at the extremities of the vineyard.

If neceſſity forces to replant an old vineyard, all remains of the old vines muſt be extirpated. The ground ought then to be dunged, with old dung, if it can be had, if not, with new, and trenched moſt carefully, picking out every remaining root, which ſhould be collected and burnt. The trenched earth ſhould then be covered with old dung, which does not breed weeds, or with freſh earth brought from among thickets. Columella adviſes particularly, to have a careful overſeer to inſpect the work-men, and to be watchful that they do not make baulks.

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[d] *Lib.* VI. *c.* 13.

Mr. Miller, inſtead of trenching the ground as the ancients did, propoſes giving it a ſummer fallow, plowing it as deep as the ſoil will admit of, and clearing it of roots, weeds, or whatever elſe can obſtruct the growth of the plants.

## *ARTICLE* III.

### *Of the choice of cuttings of Vines.*

COLUMELLA adviſes great care to be taken in the choice of the vine from which the cuttings are taken, and is therefore againſt purchaſing ſtrange plants at a venture, which may come from a ſoil and climate different from that they are intended for, and may not be of the ſort of vine which is deſired. A vine cannot be ſaid to be fruitful, becauſe it bears many grapes; for this may ariſe from the largeneſs of the trunk, and the great number of bearing ſhoots, which may have but a ſingle bunch on each. If ſeveral bunches of grapes are ſeen to hang from each ſhoot; if from each bud left the former year, ſhoots with fruit ſpring forth; if the ſhoots which ſpring out of the trunk of the vine have ſome bunches; and if even the ſecondary ſhoots, or thoſe which grow out of the preſent year's ſhoots, bear grapes; that vine may undoubtedly be eſteemed fruitful, and fit to afford cuttings. Whoever has this much at heart, will mark the vines which have been the moſt fruitful, and have yielded the ripeſt and ſoundeſt grapes, with ochre and vinegar, that it may not be waſhed off by the rain. Nor is this to be done for one year only; but the vines ought to be examined for three or more vintages, to know whether they preſerve the ſame degree of fruitfulneſs: for then it will be certain, that the fruitfulneſs muſt be owing to the good quality of the vine, and not to a favourable ſeaſon. Whatever grapes come to their full maturity without being rotted or damaged, for ſeveral ſeaſons running, will yield more, and higher flavoured wine, than any others.

It is not enough that the ſtock from which the cuttings are taken be fruitful, but they muſt alſo be taken from thoſe parts of it which promiſe the greateſt fruitfulneſs. Thoſe which grow from the ſtem or old wood of the vine, ſeldom bear fruit, or produce fruitful vines. Thoſe which grow from the ſummit of the vine are reckoned too luxuriant to plant; and though the number of cluſters on them may promiſe fruitfulneſs, yet they ſhould not be relied on; but rather thoſe which grow out of the middle of the vine, of which the wood is firmer than that of the former. This Columella calls[e] the genital part of the vine; and ſays, that having followed reaſon as his guide, and alſo a long experience, he chooſes from that fruitful part of the vine, ſhoots which, bearing plenty of fruit already, promiſe fecundity for the time to come. He is not contented with ſingle cluſters, but chiefly approves of thoſe which have the moſt numerous offspring; and adds, that the neglect of theſe rules has rendered many vineyards leſs fruitful, indeed ſome quite barren, when the cuttings have been very improperly choſen.

Some are of opinion, that the whole ſhoot, as it is taken from the ſtem, is fit for planting; and for that end, they cut it into pieces of five or ſix eyes, each of which they plant. Others, with more reaſon, think that no part of the ſhoot is fit for being formed into a cutting, but only that part of it which is next to the wood of the former year: for every bearing ſhoot abounds in fruit below the fifth or ſixth eye. The reſt, either bears no fruit, or produces only ſlender twigs. The antients, ſays Columella[f], always preſerved ſome of the old wood to the cuttings: but experience has ſhewn that this is wrong; for whatever is left of the old wood ſoon roots, when it is moiſtened and covered with earth, and kills the tender roots next to it; and when this happens, the whole vine ſhrivels, or is burnt up. Whatever remains of the old wood ſhould therefore be cut off, where the ſhoot grows to it, that the ſhoot may be planted with it's own ſmall head.—Mr. Miller differs here in opinion from Columella; for he directs, that the ſhoots ſhould be cut from the old vine, juſt below the place where they were produced, taking a knot, or piece of the two years old wood to each, which, ſays he, ſhould be pruned ſmooth.

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[e] *Lib.* VI. *c.* 10.

Were cuttings, thus choſen, taken from the vines every time they are pruned, for ſeveral vintages, and carefully planted, vineyards might be raiſed, which would yield plenty of the moſt generous wines: nor need we grudge this delay; for when once we are aſſured of the fruitfulneſs of a vine, it may be multiplied by engrafting. This, ſays Columella, you, Publius Silvinus, can witneſs: for, from one early vine on your eſtate, I engrafted the ſtocks of two *jugera* of vineyard in two years. How much therefore, may the vine be multiplied from theſe two *jugera*, ſeeing that theſe are the offspring of only one?

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[f] *Lib.* IV. *c.* 17.

ARTI-

## *ARTICLE* IV.

### *Of the Nurſery for rearing Vines.*

THERE are two ways of planting vineyards; *viz.* either with cuttings, or with vines which have already taken root. Theſe laſt are called quickſets. In the provinces, ſays Columella [g], they plant cuttings, for they will not be at the trouble of having nurſeries. The expert huſbandmen in Italy do not approve of this practice, becauſe the quickſets are attended with ſeveral advantages. They are leſs apt to die; and by reaſon of the greater firmneſs of their wood, they ſuſtain better the extremities of heat and cold, and other intemperatures of the weather: and the tranſplanting of them quickens their producing grapes. Cuttings may do in a looſe yielding mould; but a ſtrong heavy ſoil muſt have rooted vines, or quickſets.

Mr. Miller prefers good cuttings to rooted vines, for planting a vineyard; becauſe the roots of vines do not grow ſtrong and woody, as thoſe of moſt ſorts of trees do, but are long, ſlender and pliable; and therefore, after they have been taken up, they ſeldom ſtrike out any fibres from the weak roots; but theſe generally ſhrivel and die, and thereby rather retard, than help, the plants in their growth, by preventing the new fibres from puſhing out.

This difference of opinion between Columella and Mr. Miller may be accounted for, from the different depths at which they direct the vines to be planted: for were cuttings to be planted two feet and an half deep, no roots would ſhoot out from their loweſt part; and if the rooted vines were planted ſo ſuperficially in Italy as Mr. Miller adviſes, they would be dried up by the ſun.

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[g] *Ibid.* c. 14.

Columella directs [h] that the nurſery be made, neither in a poor hungry ſoil, nor in an ouzy wet one; yet where there is moiſture enough; and in a middling rather than a rich ſoil; becauſe, though cuttings take root ſoon, and make ſtrong ſhoots in a rich ſoil; yet, when tranſplanted, they ſhrivel, and ſeldom recover. It is therefore the huſbandman's intereſt, rather to tranſplant from a middling ſoil to a rich one, than from a rich to a poorer. From a rich ſoil to a rich ſoil, they will thrive apace. It is not adviſeable to make the nurſery in very poor land, becauſe many of the cuttings will then die, and the others will arrive but ſlowly at a ſtate to bear being tranſplanted.

The nurſery ſhould be trenched to the depth of two feet and an half, and being formed into beds three feet wide, the cuttings are planted in them at about a foot diſtance from one another, every way. This may be done either in the ſpring or in autumn. The ſpring is beſt if the climate be cold, or ſubject to much rain; and the autumn, if the climate be warm, and the ſoil dry, or ſituated on the ſide of a hill.

The length of the cuttings ſhould be regulated by the diſtance between their eyes: for when theſe are near one another, the cutting may be ſhorter, and when they are more diſtant, it ſhould be longer. This length ſhould not exceed a foot, nor ſhould it be leſs than three fourths of a foot, leſt, being planted on the ſurface of the earth, the cutting ſhould periſh with drought in the ſummer; and, on the other hand, becauſe when a cutting planted too deep has taken root, it cannot be taken up without ſome difficulty. If the cuttings are planted on the ſide of a hill, their length may be about fifteen inches. On ouzy ground, they need not have above three eyes, which may reduce them to nine inches, but certainly to more than ſix. In theſe three eyes are not included the numerous eyes which uſually are on the cutting, near the part where it is taken from the ſtem: beſides thoſe numerous eyes, there ſhould be three others, with joints. The cuttings ſhould be planted ſo deep, as that the uppermoſt eye may be level with the ſurface of the ground; becauſe all the ſap will then be employed in one ſingle ſhoot, which will conſequently be ſo much the ſtronger. They ſhould be planted as ſoon as poſſible after they are cut off the vine; and in doing this care ſhould be taken to avoid a ſtrong drying wind, or a ſcorching ſun. It is therefore beſt to chooſe a calm day, or at leaſt a day in which there is but little wind. The ſun may be kept off by ſhades, or any covering. The nurſery ſhould afterwards be kept clear of weeds, and be frequently dug. Only one ſhoot ſhould be reared, and that ſhould be faſtened to a ſtick or ſlender pole, to bear it off the earth. The reſt ſhould be carefully rubbed off; and this ſhoot ſhould be pruned down to two eyes in the autumn. The ſtrongeſt ſhoot from theſe eyes ſhould be reared the next ſummer; and with this management the cuttings will be fit to tranſplant at the end of thirty or thirty ſix months.

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[h] *Ubi ſupra*, c. 5.

Vines are likewiſe propagated by layers. For this purpoſe, a trench is dug four feet every way, that the layer may not be hurt by other roots. A ſhoot of the laſt year is then laid down in it, in ſuch manner as to make it's end riſe at the farther part of the trench. Four eyes are left on that part of the layer which goes to the bottom of the trench, and they are to put out roots. All the eyes between them and the ſtem ſhould be rubbed off, to prevent the growth of uſeleſs ſhoots. Two, or at moſt three, eyes are left on the farther end, which riſes out of the earth, and all the reſt, between them and thoſe at the bottom of the trench, are rubbed off. The layer thus prepared ſoon takes deep root, and in the third year, it may be cut off from the mother vine. When the ſhoot is not long enough to riſe again out of the earth, Columella thought of the following method. The end of the ſhoot is brought to the bottom of the trench, and the four lower eyes, left for the roots to ſhoot from, are covered with earth, as before: but inſtead of the eyes at the extremity, as in the former way, the two eyes next the ſurface of the earth, of that part which comes from the ſtem, are left to make ſhoots, which they readily do, and in the third year, the layer may be cut from the mother vine, as in the other caſe. In order to encourage the roots to ſtrike out, they need not be covered with the whole depth of earth the firſt year, unleſs it ſhould become neceſſary before the winter, to keep the roots from being chilled by water which might gather in the trench.

## ARTICLE V.

### *Of planting the Vineyard.*

THE ground being thoroughly prepared, by trenching, harrowing, and clearing it of every thing that can be hurtful to the vine, it is marked out, in order to be planted. The Romans planted their vines five feet aſunder in a poor ſoil, ſix feet aſunder in a middling ſoil, and at the diſtance of ſeven feet from each other in a rich ſoil. Sometimes too they left a ſpace of ten feet between them, that there might be ſufficient room for the ſtrong ſhoots to extend themſelves.

They generally planted their vineyards in a quincunx form, for which they marked out the ground by ſtretching acroſs it a line trimmed with bits of red cloth, or of ſome other conſpicuous colour, at ſuch diſtances from each other as it was intended to leave between the rows. A piece of reed was ſtuck into the earth at each ſpot indicated by the cloth, and this was repeated till the whole field was marked out in equal diſtances. The planter followed, and dug a hole at each alternate reed, two feet and an half deep in level ground, two feet and three quarters if it lay ſloping, and three feet deep where the declivity was conſiderable. He then removed the quick-ſets from the nurſery, taking them up with great care, and tranſplanted them the very ſame minute, if that was poſſible. All their ſhoots were previouſly pruned off, except one, which was the ſoundeſt and firmeſt, and of that only two eyes were left above ground. If any of the roots were hurt in taking them up, though all poſſible care was uſed not to injure them, they were cut off, very ſmooth. If two plants were ſet in the ſame hole, a few ſtones, of about five pounds weight, were laid between them in the bottom of the hole, to prevent their roots from interweaving together. They were likewiſe of opinion, that theſe ſtones ſaved the roots from being chilled in the winter, or ſcorched by the heat of the dog-days in the ſummer. Mago adviſed to lay the huſks and ſtones of grapes mixed with dung, in the holes, under the roots of the vines, as a means of ſtrengthening them, and of haſtening the production of young roots. During the chilling wet of the winter, they gave a warmth; and in the ſummer, they afforded a nouriſhing moiſture.

Columella diſapproved greatly of putting two vines in the ſame hole, becauſe their roots conſtantly mingled together, and formed a kind of net work, which retained too much moiſture in the winter, and, by robbing each other of nouriſhment, proved prejudicial to both. If the ſoil of the vineyard was poor, Mago directed that the holes ſhould be filled up with rich earth brought from elſewhere. The ground ſhould be a little moiſt when the vines are planted; but it had better be dry, than miry wet.

Mr. Miller orders that the ground, which he before directed to be fallowed, be again well plowed in March; and that after having laid it's ſurface even, the rows ſhould be marked out, from South-Eaſt to North-Weſt, at the diſtance of ten feet from each other. He then croſſes theſe rows at the diſtance of five or ſix feet, and thereby marks the ſpot where each plant is to be ſet. The rows will conſequently be, in this caſe, ten feet aſunder, and the diſtance between the vines in each row will be five or ſix feet; nearer than which they ought never to be planted. If they are ſet in ſquares ſo near together as ſix feet, there cannot be room for a ſufficient current of air to paſs between them when their branches are extended on one ſide; and for want of that the damps in autumn will be detained among the vines, to the great prejudice of their fruit. In places abroad, continues he [1], where they regard the quality of their wine more than the quantity, they never plant their vines at leſs than ten feet, row from row, and ſome allow twelve: and he confirms the juſtneſs of this rule by what happens to other fruits, which are never ſo well coloured, ſo early ripe, or ſo well flavoured, when in cloſe plantations, as when they are produced on trees where the air can circulate freely about them, and the rays of the ſun have free acceſs to the branches, whereby the juices are better prepared.

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[1] *Gardener's Dict.* Art. VITIS.

Preferring cuttings to layers, as well as to rooted vines, he directs, that the cuttings be taken from the vine in the autumn, and that, their ends being made ſmooth, they be laid in the ground, about two inches deep, the reſt of the cutting being left at full length; only obſerving to cover them with dry litter, or peas haulm, in dry froſty weather. In moiſt weather, the covering ſhould be taken off, leſt it heat, and make the cuttings grow, which would greatly injure them. In April, which he reckons the beſt ſeaſon for planting vines in England, the cuttings ſhould be taken out of the ground, and their upper parts cut off, ſo as to reduce them to about fourteen inches in length, according to the diſtance of the buds or eyes. He thinks it of great ſervice to leave their tops on all the winter, becauſe the air would otherwiſe penetrate the wounded part, and greatly injure the remaining eyes. The lower ends of the cuttings ſhould be put in water, about three inches deep, ſetting them upright, for ſix or eight hours, before they are planted, in order, to moiſten them and open their pores: then, at the centre of every croſs mark, before made, a hole ſhould be dug with a ſpade, about a foot deep, and one ſtrong cutting ſhould be ſet, a little ſloping, in each of theſe holes, which ſhould afterwards be filled up immediately with earth preſſed down gently to the cutting. This earth ſhould be raiſed about three inches round each cutting, ſo as juſt to cover it's upper eye or bud, to prevent the wind and ſun from drying it; for only that upper bud will ſhoot when the plant is thus managed.

Mr. Miller juſtly blames his countrymen for planting their vineyards, in the few attempts that have been made of them in England, with ſuch grapes as are the ſweeteſt and beſt for eating; this being contrary to the general practice abroad, where the rough auſtere grapes, which are by no means palatable, but which are by experience found to afford a noble rich wine, are preferred. This is alſo agreeable to the conſtant practice of the makers of cyder, who obſerve, that the beſt eating apples yield but a poor juice, and that the rough ſorts afford a ſtrong vinous liquor. I believe, continues he, that it will be found true in all fruits, that where the natural heat of the ſun ripens and prepares their juices, ſo as to render them palatable; whatever degree of heat theſe juices have more, either by fermentation, or from any other cauſe, will render them weaker, and leſs ſpirituous. Of this we have many inſtances in fruits: for if we tranſplant any of our ſummer or autumn fruits, which ripen perfectly in England without the aſſiſtance of art, into a climate a few degrees warmer, theſe fruits will be mealy and inſipid. So likewiſe, if we bake or ſtew any of theſe fruits, they will be good for little, becauſe they will loſe all their ſpirit and flavour by the additional heat of the fire: and on the other hand, many fruits which are not even eatable whilſt raw, are thereby much improved. Some of theſe which have been tranſplanted into a warmer climate, have been ſo altered by the greater heat of the ſun, as to excel the very fineſt of the fruits that are ripened in this country. The grape moſt likely to ſucceed in England, is the Auvernat, or true Burgundy grape, which thrives very well in ſeveral places north of Paris.

Columella[k] adviſes every prudent huſbandman to ſtock his vineyards with different ſorts of vines, becauſe the weather is not ſo equal in any year, but that it may be more hurtful to ſome, than to others. If, therefore, he plants but one kind of vine, and the weather happens to be prejudicial to it, he will be deprived of his whole vintage: but if he has vineyards of various ſorts, ſome of them may eſcape, and yield him fruit. He recommends particularly, that each kind of vine be planted by itſelf; becauſe otherwiſe one of the following inconveniencies will enſue; *viz.* either he muſt gather his late grapes with thoſe that are early ripe, which will cauſe an acidity in the wine; or if he waits till the late fruit come to maturity, the early grapes will be rotten, or deſtroyed by birds or rain: for the diſtinguiſhing of each kind cannot be truſted to the gatherer's diſcretion. The flavour of the ripe grapes is hurt by the addition of the unripe; nor will the wine made of them both, mixed together, keep till it is old. When each ſort is ſeparate, the vine dreſſer will be able to prune and manage it in the moſt proper manner.

He cautions his readers ſtrongly againſt the too prevailing opinion of thoſe who imagine, that the chief care and trouble are at an end when the vineyard is planted. He obſerves, that the vine is a tender delicate ſhrub, which can very ill bear neglect, and which, when young, often deſtroys itſelf, by being permitted to run too much to wood, or to bear too great quantities of fruit. Moſt people are ſo intent on having much fruit, that they load the vine with too many bearing branches, without having any regard to future years, or to poſterity; and then complain, that their vineyards do not anſwer their expectation, when they themſelves have deſtroyed them, either through covetouſneſs, negligence, or ignorance. When the vine has arrived as it's full ſtrength and maturity, it can better bear ſome neglect. Believe Silvinus, ſays this excellent huſbandman to his friend[1], what I know from my own experience, that a vineyard judiciouſly planted with good vines, and well cultivated, never fails to bring it's owner a moſt abundant return. This he confirms from Græcinus, by the example of Pavidius Veterenſis, who had two daughters, and a farm planted with vines. He gave the eldeſt daughter one third of his farm, on her marriage, and yet had as much fruit from the remaining two thirds, as he had before from the whole. He afterwards gave half of the remainder to the younger daughter, on her marriage, and ſtill had as good an income as at firſt. This, ſays Columella, muſt ariſe from the remaining third's being proportionally better cultivated, than the whole had been before.

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[k] *Lib.* III. *c.* 20.

When the vineyard was perfectly well cultivated, and in a good ſoil, the Romans planted cuttings in the ſpaces between the vines, where they grew as in a nurſery. The vines and cuttings ſoon throve and gathered ſtrength, when the ground was kept in ſo looſe a ſtate by frequent digging, as to be reduced to powder, and always perfectly free from weeds, which would conſume the nouriſhing moiſture that ſhould feed the plants, whoſe roots extended eaſily in ſuch looſe mould. It was a general rule, that the diggings ſhould be repeated once a month, from the firſt of March to the firſt of October; and all weeds were carefully pulled up by hand, and carried off the ground, leſt they ſhould take root again. Mr.

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[1] *Lib.* VI. *c.* 3.

Miller ſays, that as the ſpace between the rows of vines is great, the ground there may be ſown or planted with any kind of eſculent plants, provided they are kept at ſuch diſtance from the vines, that theſe be not injured by them. This huſbandry, which is alſo the method in France, may be continued three or four years, till the vines come to bearing; but after that, no ſort of crop ſhould be ſet between them in the ſummer; becauſe, the clearer the ground is kept, the more heat will be reflected to the grapes. After theſe are gathered, a crop of coleworts, for ſpring uſe, may indeed be planted between the rows, and the ſtirring of the ground for them will be of great ſervice to the vines.

## *ARTICLE.* VI.

### *Of Pruning the Vine, and of it's future management.*

FROM the time that the vine firſt begins to bud, all ſuperfluous ſhoots muſt be carefully rubbed off, that the nouriſhment may be conſumed by thoſe only which are to be reared. Two ſhoots are generally ſet apart for growth; the one as a reſerve, in caſe the other ſhould fail. As ſoon as they riſe, a prop ſhould be ſet in the ground, for each of them. This prop ſhould be ſlender, becauſe the weak tendrils of the vine will then lay hold of it more eaſily than if it was thick. As the ſhoots grow up, they are tied to the props with a ſoft ſlack binding, till their tendrils have encircled them; and at leſs than four feet from the ground, ſticks are faſtened acroſs the props, that the vines may extend laterally, and thereby be the leſs expoſed to the force of winds. In nurſeries, this croſs ſtick, or rail, ſhould not be above a foot high, leſt ſtrong winds ſhould tear the young plants out of the earth. When the ſhoots are grown nearly to their full height, their tops are broken off, to make them increaſe in thickneſs and ſtrength, rather than run up into a needleſs length. The moſt thriving ſhoot, which is to be the leading wood branch, muſt be trained up ſtrait, and kept clear of ſecondary ſhoots for three feet and a half from the ground: but ſuch as grow above that height may be permitted to remain till the autumnal pruning; for if they are all rubbed off, new ſhoots will immediately ſpring out from other eyes, ſo that, perhaps, none may be left for the next year's buds. The ſhoots which are rubbed off from time to time, ſhould never be ſuffered to grow ſo ſtrong as not to be eaſily diſplaced with the finger; for the heat in ſummer hurts the vine greatly wherever it has been wounded with a knife. For this reaſon, if it ſhould be abſolutely neceſſary to uſe the knife, a piece of the ſhoot which is cut off ſhould be left prominent from the ſtem, to ſtop the effect of the heat, which, in that caſe, will not proceed farther.

About the middle of October, or before the cold came on, the Romans *ablaqueated*, as they called it, the roots of their vines; that is, they laid them bare, ſo as to expoſe to view the upper ſmall roots which the vine had put forth in the ſummer, and which ſhould be cut off with a knife: for if theſe are ſuffered to grow large, the lower ones will decay, and the vine will then be nouriſhed only by roots, which, extending themſelves along the ſurface of the earth, or but little deeper, muſt be expoſed to the inclemency of the winter's froſt, and be liable to be parched by the drought and heat of the ſummer. Whatever roots appear within a foot and an half of the ſurface muſt therefore be cut off. The beſt way is to cut them about an inch from the wide, as the ſoil is rich or poor, in order that the ſhoots of the vine may be ſpread accordingly. Care ſhould be taken in lopping the elm, that the body of the tree be as little hurt as poſſible, and that the bark be not torn off, for this would do it great prejudice. The earth ſhould be kept looſe around the trees; and all ſuckers, or whatever elſe might ſhade the vine, ſhould be cut away. When the tree grows old, and, either by a wound or otherwiſe, water lodges in it, a hole ſhould be bored, or a channel cut, to give an outlet to the wet.

The vines ſhould be planted before the trees are very ſtrong. A young elm may bear a young vine, but it would be killed by an old one; wherefore their ages and ſtrength ſhould be proportioned. A trench muſt be dug for the vine, two feet and a half wide, three feet deep, five or ſix feet in length, and at leaſt a foot and an half diſtant from the tree; for if it be planted nearer, the roots of the tree will not permit thoſe of the vine to ſtrike deep enough, and as the tree grows, it will oppreſs the vine. For a vine that is to be planted in the ſpring, the trench ſhould be dug in the preceding autumn; that the earth may be mellowed by the winter's rain and froſt: and if it is to be ſet in the autumn, the holes ſhould be laid open ſome weeks before, that the ſoil may have the benefit of the ſun and rain. Though Columella had before found fault with putting two plants in the ſame hole; he here adviſes to put two in each trench, a foot aſunder, that they may the ſooner clothe the tree. A northerly wind, and cold dews, ſhould be avoided at the time of ſetting them. If the climate is temperate, inſtead of having two plants in the ſame trench, a trench may be made on the Eaſt, and another on the Weſt-ſide of the tree, and a vine may be planted in each;

by which means their roots will have ſufficient room to extend in. Though Mr. Miller, as I obſerved before, thinks it of little conſequence whether a tree that is tranſplanted be ſet to the ſame aſpect as it had in the nurſery; Columella recommends, as a circumſtance which is attended with great advantage, particularly to vines (but he extends it to all trees which are removed from the place of their firſt growth) to mark them before they are taken up, in order that the ſame ſide may ſtill be turned to the ſun. In dry and warm ſituations, where neither a ſevere winter, nor a very wet one, need be feared, the autumn is the beſt ſeaſon for planting both vines and trees; laying under their roots the depth of half a foot of the richeſt and fineſt mould, and covering them with well dunged earth. The vine ſhould be planted in the trench with its ſtem inclining to the tree, againſt which it is to riſe up ſtrait: and it muſt alſo be defended from cattle. In hot countries, the vine ſhould be planted on the North-ſide of the tree; in cold ones, on the ſouth; and in temperate climates, either on the Eaſt or the Weſt, that it may not be all the day in either the ſun or the ſhade.

In the next autumn, the vines are pruned, as already directed, for frames. When they have reached the firſt ſtory, ſhoots ſhould be diſtributed to each branch, leaving a leading ſhoot, which is to go up to the top of the tree: and thus each ſtory is gradually covered. It is a rule with many, to load chiefly the lower part of the tree, becauſe there the vine bears moſt grapes, and they are moſt eaſily gathered: but thoſe who regard the quality more than the quantity of their wine, clothe the upper branches moſt, and garniſh the reſt with bearing ſhoots in proportion to their ſtrength. The future pruning conſiſts in cutting off the ſhoots which bore fruit for the laſt vintage, and in rearing others in their place. If the vine is very thriving, the bearing ſhoots may be permitted to hang down ſloping from the branch, to which their extremities ſhould then be brought back, and tied: or if the vine is very luxuriant, they may be carried to the next tree. Though theſe ſhoots yield a great deal of fruit, they muſt be cut off at the next pruning, becauſe, otherwiſe, they would weaken the vine too much. No ſhoots ſhould be ſuffered to grow out of the firm wood, unleſs they are wanted in order to marry them to a widowed branch.

The young vine is tied to the tree at about four feet from the ground, and with this binding its growth may be checked, if it be too luxuriant, or if the tree has been deprived of its branches. It ſhould be tied again at about half way up, and a third time at the top. The vines ſhould be looſened every year, becauſe they are then moſt eaſily pruned and cleared of all imperfections; and they are refreſhed by being bound in new places. They are alſo then in leſs danger of being galled by the binding. The bearing ſhoots ſhould be ſo laid on each branch, as that, being tied above the third eye, they may hang ſlanting down: but they muſt not be tied tight, leſt the binding ſhould cut them. At the ſame time that ſome ſhoots are thus laid for bearing fruit, others ſhould be trained up to the body of the tree, to produce wood for the next year.

If the vine does not clothe the tree ſufficiently, a ſhoot may be turned down to the ground at the autumn pruning, and made a layer, from which as many young plants may be raiſed, as, being led up to the tree, will cover it enough. When the trees decay, young ones ſhould be immediately planted in their ſtead; and when the vines begin to be worn out, they ſhould be renewed by layers from neighbouring vines, as we ſhall ſoon ſee judiciouſly and ſucceſsfully practiſed by M. de Chateauvieux, rather than by quickſets.

To the foregoing directions for the cultivation of tall vines in Italy, and the ſame are equally applicable to all other warm countries, Columella adds * the following account (which I ſhall likewiſe abridge from him) of the manner in which vineyards of lower growth were managed in the provinces of the Roman Empire.

The husbandman there never trenched all the ground, but only opened a deep furrow, in which the vines were ſet. This might be ſufficient where the ſoil was naturally looſe. In ſome of theſe vineyards, the plants ſtood without any props; in others, they were faſtened to rails; ſometimes they were tied to dwarf trees; and ſometimes they were ſuffered to run upon the ground. In the firſt of theſe caſes, a ſingle ſtem was reared up, free from ſide-ſhoots, till it had acquired ſtrength enough to ſupport the fruit-bearing branches, which, when they were of a ſufficient length, were bent down in a circular form, and tied to the lower part of the ſtem. In the ſecond caſe, the fruit-bearing ſhoots were trained to rails, or eſpaliers, as they grew. In both theſe ways, the planting, pruning, and other culture, differed ſo little from the general directions already given, that it would be needleſs to particularize them here; eſpecially as I ſhall ſoon have occaſion to ſpeak pretty fully of the management of low and of middle ſized vines, as now practiſed by the French, whoſe beſt vineyards conſiſt of none elſe. As to letting them trail upon the ground, Columella

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* *Lib.* III. *c.* 14. *and alibi.*

mella juſtly thinks it ſo bad a method, that no excuſe can poſſibly be offered for it, unleſs the country be indeed uncommonly ſubject to very high winds: — and then, perhaps, a doubt may ariſe, whether ſuch a place be at all proper for the vine.

In Gaul, the trees for ſupporting the vines, beſides being kept very low, were, of choice, ſuch as had the feweſt leaves. The poplar was therefore much eſteemed for this purpoſe; for which the hornbeam, the mountain aſh, and ſometimes the willow, were alſo reared. The willow was planted only in moiſt places, where other trees could not thrive well; becauſe it was thought to hurt the taſte of the wine. The elm was likewiſe ſo managed, whilſt young, as to be turned to a dwarf; as it may eaſily be. In dry and hilly ſituations, the ſtories of theſe trees were about eight feet high; and in vallies, or moiſt places, about twelve feet. Theſe trees were generally divided into three branches, out of which ſeveral leſſer boughs aroſe; and all the ſmall twigs were uſually cut off, at the time when the vine was pruned, to prevent their ſhading the fruit too much. If the dwarf trees were planted where corn grew, they were ſet twenty feet aſunder in rows forty feet diſtant from each other: but when they were planted where there was no corn, their uſual diſtance was twenty feet every way. Here the young ſhoots of the vines were more frequently carried from one tree to another, than when the trees grew high. If the trees were too far aſunder to afford a ſupport to the ſhoots, poles were extended between them, and theſe were up-held by props, as ſoon as the weight of the grapes began to be too heavy for them. In all other reſpects, the culture of the vine was the ſame as in Italy.

In clearing the vines of their ſuperfluous ſhoots and leaves, Columella obſerves that, in the provinces, in places which were ſhaded, or where the ſun had not much force, or which were moiſt and cold, the vine-dreſſers uſed to ſtrip the vines of many of their leaves, that the fruit might be the better ripened by the warmth of the ſun, and not be rotted by too much moiſture: but in places that were dry, warm, and expoſed to the heat of the ſun, the grapes were left covered with their leaves and twigs; and if the vine had but few ſhoots and leaves, the fruit was ſheltered by ſome other covering. "Thus," ſays he (in the paſſage before quoted *), "my uncle, Marcus Columella, "a man ſkilled in all the liberal arts, and the moſt "diligent farmer in Bœtica, covered his vines with "mats in the beginning of the dog days; becauſe, "during that ſeaſon, the country was ſubject to a "ſcorching eaſterly wind, which, like a fiery vapour, burnt up the grapes, if they were uncovered."

That the reader of this work may receive every uſeful information in my power to give, and that as much light as poſſible may be thrown on a ſubject which, with due attention, and the experience of a few years, may undoubtedly be rendered an object of ſuch high importance to the induſtrious and deſerving inhabitants of ſeveral parts of our immenſely extenſive territories in America, as to procure very great advantages to them, and at the ſame time ſave to their mother country at leaſt a conſiderable part of what it now coſts her for the wines of other nations, ſome of which make her but little, or no requital in trade; I have conſulted carefully the writings of the moſt celebrated

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* *Page* 313.

celebrated among the moderns who have treated of this branch of huſbandry, and ſhall here add, from them, the few following remarks on the culture of vineyards in France.

## *ARTICLE* VIII.

### *The preſent method of cultivating Vineyards in* FRANCE.

AFTER obſerving that, though each province of that kingdom has its peculiar manner of dreſſing and managing the vine, as well as of making wine, yet theſe differences are not at all eſſential, as the fundamental rules of practice are conſtantly the ſame, and no way affected by a few variations which cuſtom has retained in particular places, and which ſerve only to conduce to the perfecting of this art; the authors of the *Maiſon ruſtique* draw their precepts [*] from the actual and moſt approved practice of Burgundy, Champagne, and Orleans, the wines of which countries are deſervedly held in the higheſt eſtimation.

Their directions for the choice of the ſoil, its ſituation, aſpect, the manner of planting it, and the future cultivation of the vine, are ſo like to thoſe of Columella, that it would be needleſs to repeat them here. — They are, indeed, more explicit as to the grafting of the vine, which is performed in cleft, as for many ſorts of fruit trees, but with this difference, that a ſmooth part of the vine, at the diſtance of about ſeven or eight inches from the ſtem, and between two joints, is the moſt eligible part for inſerting the cion, which, as repeatedly ſaid before in other ſimilar caſes, ſhould always be taken from the beſt bearing branch of the moſt fruitful vine. All ſmall roots are cut away from about the place where the graft is to be inſerted, and after it has been exactly fitted in the cleft, ſo as to make the inner bark of the cion coincide preciſely with that of the ſtock, the wound is carefully bound up tight with ſlips of the inner bark of a young lime tree, of a willow, or with baſs, in ſuch manner as effectually to preſerve it from the entrance of air or wet. The graft and its ſtock are then bent gently downward into a hole made on purpoſe to receive them, and are covered with earth ſo as to leave only two eyes of the cion above ground. The cion ſhould be uſed as ſoon as poſſible after it has been cut, and its length ſhould be about twelve inches.*

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[*] *Tom.* II. *Part* 3. *Lib.* 6. *c.* 1.

Neither the middle ſized vines, nor the low ones, of which two ſorts all the beſt and principal vineyards in France conſiſt, ſhould be ſhaded by any neighbouring buildings, or trees. The tall vines in the ſouthern provinces of France, ſuch as Provence and Languedoc, are, like thoſe in Piémont, Italy, and other very warm countries, reared up to trees, or formed into alcoves or arched walks, the better to defend them from the too ſcorching heat of the ſun. The ſorts thus planted are chiefly the *cioutat*, the *corinth*, the *Damaſcus* grape, and the *bourdelais*. The vines about Auxerre are trained up againſt eſpaliers and trelliſes; but thoſe of the loweſt growth, of which moſt of the vineyards about Paris, Beaune, Tonnere, Chablis, &c. conſiſt, are faſtened only to common props, and are generally found to produce the greateſt quantity of fruit, and, in ſome years, the beſt wine.

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* *Ibid.* c. 2. Art. 4.

The people of Champagne, (who think that there is in the ſoil of their province a quality ſo peculiarly fit for the production of fine wine, as can never be found or imitated elſewhere,) plant their talleſt vines in their middling lands, and the low ones in their beſt grounds. The former of theſe are reared to the height of four or five feet, and the latter to about three. They obſerve, that their vineyards yield the higheſt flavoured wine when they are moſt expoſed to the ſun; and therefore they always prefer a ſloping ſituation, fully open to the ſouth, for their beſt growths. They alſo prefer ground which is ſomewhat ſtony, and not naturally ſubject to much moiſture. They manure this ſoil from time to time, by laying on dung and freſh earth; but with caution not to uſe too much dung, becauſe that would render the wine flat and inſipid, and apt to become ropy. They think cow's dung better than that of horſes, for their fineſt ſoils, becauſe it is not ſo hot: but for ſtiff lands they uſe thoroughly rotted horſe-dung, and ſheep's dung, which they mix with about double the quantity of cow dung, to prevent it's burning the roots of the vines. Towards the end of autumn, they ſpread in trenches cut acroſs the vineyard, layers of this dung and of freſh earth, and after this mixture has remained there all the winter, to moulder, and grow mellow, they lay about half a baſket full of it, early in the ſpring, to the roots of each vine, and particularly to thoſe of the lateſt planted; making for that purpoſe a hole around it, deepeſt at it's back, where the ſloping ground is higheſt. This is done over the whole vineyard either every eight or tenth year, or, which amounts to the ſame, to an eight or a tenth part of it each year.

The grapes moſt generally cultivated in Champagne are a ſmall black ſort; and to render the wine of that country the more perfect, great care is taken to root out all white ones, and ſuch as, though black, are large and coarſe: or, if thoſe vines are not pulled up, they are grafted with ſuch fruit as is deſired.

About the end of June, and ſometimes even in May, according to the forwardneſs of the vine, the upper end of each ſhoot is nipped off, in order that the greater quantity of nouriſhment may be conveyed to the fruit; for it is beſt that no part of a low vine be more than two feet and an half, or three feet, high from the ground. Theſe low vines are *earthed*, as it is called, every ſpring; that is to ſay, they are inclined down into a hole dug cloſe to them, and their ſhoots, being previouſly pruned to ſuch lengths as are moſt conſiſtent with the vigour of the vine, are covered with earth ſo as to leave only three or four of their eyes above the ground.—— In upper Picardy, it is the cuſtom to renew, as it is termed, the vineyards every year, by burying the vines in this manner, and converting each branch into a layer.

It is a general rule, that the ſtronger the ſoil is, the farther aſunder the vines ſhould be planted; and that no layers, grafts, or cuttings ſhould be uſed, but ſuch as have a ſmooth ſhining bark, and of which the wood is of a clear green when cut. Thoſe that are of a brown green, when a little bit of their rind is raiſed up with a knife, are rejected, as good for nothing.

To guard againſt the bad effects of froſts and fogs, the French vine-dreſſers, whenever they apprehended any danger of that kind, lay along that ſide of the vineyard from whence the wind blows, a ridge of dry litter, or ſtraw, which they then burn ſlowly: but if, notwithſtanding this, the vines are frozen, they cut them down very low, to enable them to bear the better the next year.

They hold it to be neceſſary, after a thick fog, to water their vines with juice of the roots or leaves of wild cucumbers, or with powdered coloquintida, mixed with water; and they are alſo of opinion that late pruning is frequently a means of guarding againſt the mildew, becauſe their vines do not then bloſſom till the ſun is become very powerful.

Careful huſbandmen never ſuffer any one to go into their vineyards very early in the morning when dews or damps fall in May, June, or September; becauſe the dew of thoſe months, being generally cold, would bliſter the leaves of the vines if it were to be touched, and thereby fixed upon them before the riſing of the ſun, which afterwards removes that danger by drying up and exhaling the moiſture: neither do they allow them to be entered, on any account, immediately after a haſty ſpring-ſhower, while the leaves are yet wet therewith, or when they are covered with a rime or hoar-froſt.

Sea-water, ſalt and water, or ſtale urine mixed with dung and earth, are of excellent ſervice to vines which do not bear well, and to thoſe whoſe leaves turn red for want of moiſture: and it is ſaid that, when their leaves become white and dry, when their wood ſwells, and when their fruit drops off, all which are ſymptoms of decay, they are recovered by rubbing the ſtem, and watering their roots, with aſhes reduced to powder, and mixed with ſtrong vinegar.—It is moſt certain, that ſtirring of the ground around them, and keeping it in a fine looſe ſtate, will have this deſireable effect; or rather it will keep them conſtantly in ſo vigorous a condition, that there will never be occaſion to recur to other means to promote their fertility: neither will there, if this eſſential principle of vegetation is duly applied to, be any danger of the grapes ſhrivelling or growing dry upon the vine; to remedy which, if it ſhould happen through careleſs management, the authors before quoted direct to pull off all the fruit thus injured, and to water the roots of the vine with ſtale urine. They add, that if the grapes rot upon the vine before they are ripe, ſome old aſhes, or barley meal, ſhould be laid around the ſtem.

If the vines, as was before obſerved of other trees, are ſprinkled with water in which tanners have dreſſed their hides, no cattle will touch them.

The young leaves and fruit of the vine are often greatly injured by very ſmall green flies, which conceal themſelves in the young buds, and weave there a thin web, not unlike to that of a ſpider, in which they depoſit their eggs. All theſe webs, and the leaves on which the eggs have been laid, as well thoſe which ſtill adhere to the vine, as thoſe which have fallen off, muſt be carefully collected, and burnt out of the vineyard.

As ſnails and ſlugs, which do great damage to the vines, generally hide themſelves during the middle of the day, they ſhould be carefully picked up early in the morning, or juſt after dew or a ſhower of rain has fallen, eſpecially in the ſpring and autumn, which are the ſeaſons when they appear moſt; and they ſhould be cruſhed to death, or burnt.

The vine-fretters, which the French call *gribouris*, abound moſt in the lighteſt land. When a vine is attacked by theſe inſects, its ſhoots are ſhort and meagre, its leaves are full of holes, and it yields but very little fruit, and that extremely poor, though never ſo great pains be taken to cultivate it. Theſe inſects are much ſmaller than the ſmalleſt gnats, which they reſemble both in ſhape and colour. They prey upon the vine during the whole year; for, in September, they get into the ground, and there gnaw its roots, eſpecially thoſe of young plants; and in May, when the buds of the vine ſwell, they leave their former holes, feed upon the ſurface of thoſe buds, and then upon the leaves, and afterwards they fix upon the grapes, pierce their ſkin, ſuck out their juice, and lay in them their eggs, from whence proceed an infinite number of little worms, which complete the deſtruction of the fruit by the time it ſhould be gathered. To prevent this miſchief, the authors of the *Maiſon ruſtique* adviſe [*] the ſowing of a few patches of beans in different parts of the vineyard; becauſe theſe pernicious inſects will then reſort to them, and may conſequently be deſtroyed by plucking up the beans and burning them.

To get rid of numbers of other inſects, all of which endeavour to find a place of ſhelter when the winter approaches, either by creeping into the ground, or into dung or any litter that lies upon it; they recommend the method before mentioned [†], of laying a little heap of haulm, ſtraw, or any kind of mulch, round the ſtem of each vine when the weather begins to be froſty, and burning it in the ſpring, in a place out of the vineyard. Innumerable multitudes of vermin will be deſtroyed by this means: but, to render the remedy effectual, the neighbours all around muſt have recourſe to the ſame expedient, or theſe pernicious creatures will ſoon ſpread a-new from one vineyard to another.

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[*] *Ubi ſupra, c.* 2. Art. 5.

[†] *Page* 315.

Mr. Miller's method of guarding againſt flies, and waſps, which are often ſo very numerous, and voracious, as entirely to eat up all the fineſt and higheſt flavoured berries of well ripened grapes, deſerves much attention even in vineyards, though it is more eaſily practiſed in gardens: but the preventing of this miſchief will make ample amends for yet greater trouble. It is, before the grapes are quite ripe, and conſequently before they will be in much danger of being attacked by theſe enemies, to hang upon the vines, from ſpace to ſpace (the nearer the better), phials half filled with ſugared water, and rubbed at the neck with a little honey. Theſe will attract the waſps and flies, which, in attempting to get at the liquor, will fall into the phials, and be drowned. They muſt be carefully looked over every third or fourth day, to take out and deſtroy the flies and waſps, and to repleniſh them with liquor.

If, when the fruit is ripe, the ſtalks of the bunches are cut half through, about a fortnight before they are gathered, the juice of the grapes will be much improved thereby; becauſe, as not near ſo great a quantity of nouriſhment can afterwards enter the fruit, the watery particles will have time to evaporate, and the juice will be the better digeſted. This is practiſed by ſome of the moſt curious husbandmen in the ſouth of France. But if, after the bunches are cut off the vines, they are hung up in a dry room, upon ſtrings, ſo as not to touch each other, for a month before they are preſſed, both the ſtrength and the flavour of the wine will be yet more exalted. To this, in a great meaſure, is owing the delicious richneſs of the vines of that part of the Tiroleſe which borders on Italy, where it is the conſtant cuſtom to keep the grapes thus for ſome time before they are uſed, as was remarked by Dr. Burnet in his travels, and, ſince him, by a much more accurate obſerver, M. de Blanville *.

## *ARTICLE* IX.

### *Of the principal ſorts of Grapes, with the uſes for which, and the time when, they are good* †.

THE beſt and moſt general ſorts of grapes, either for the garden, for wine, or for verjuice, are 1, the *morillons*; 2, the *chaſſelas*; 3, the *muſcats*; 4, the *corinths*; 5, the *malmſies*; 6, the *bourguignons*; 7, the *bourdelais*; 8, the *ſans moireau*, or grapes *without ſtones*; 9, the *melier*; 10, the *gamet*; and 11, the *gouais*.

1. The *morillons* are of ſeveral ſorts, almoſt all of which are well known in moſt places, and of which ſome are very good, both for the table and for making wine.

The early *morillon*, which we call the *July* grape, has ſmall, round, black berries, growing looſe on the bunches. It ripens in England about the beginning of Anguſt, has a ſugary juice, with but little flavour, and is very apt to be eaten by birds and flies. It may be allowed a corner in the garden, well expoſed to the ſouth, and ſheltered from the wind: but it's only merit is it's ripening early.

The *morillon taconné*, or *black cluſter*, likewiſe called the *meunier*, or *miller*, from the hoary down of it's leaves, ripens ſomewhat later than the former,

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* *Travels through Holland, Germany, Switzerland, and Italy.*

† *Maiſon ruſtique, Tom* II. *Part.* 3, *Liv.* 6, *c.* 1. *and* MILLER's *Gardener's Dict.* Art. VITIS.

mer, yields plentifully, and makes good wine. The bunches of this are ſhort, the berries oval, and ſo cloſe together, that many of thoſe on the inſide continue green, when the outer ones are perfectly ripe. It delights in a ſandy light ſoil, ripens here in September, and is by ſome called the *Burgundy* grape: but this name belongs more properly to

The common *black morillon*, which the people of Burgundy diſtinguiſh by the appellation of *pineau*, and which thoſe of Orleans term the *auvernat*, becauſe it came originally from Auvergne. It's berries are oval, and hang looſer on the bunches than thoſe of the black cluſter grape; by which means they are ripened more equally. This ſort is very ſweet, ſugary, black, good to eat, grows well in almoſt any ſoil, and yields an excellent wine. It's leaf is rounder than that of any other ſort of grapes, and its wood, when cut, is redder. The beſt ſort is that whoſe joints are not above three fingers breadth aſunder. Another ſpecies of this *morillon*, to which the French give the name of *pineau aigret*, or *tartiſh taſted pineau*, has longer, thicker, more pithy, and leſs compact, wood than the former; it's joints are at leaſt the breadth of four fingers aſunder; the outſide of its bark is very red, and it's leaf is divided into three parts, like that of the fig tree. The berries of this are ſmaller, and hang in looſer cluſters, than thoſe of the foregoing ſort; nor does it yield much fruit: but the wine that is made of this fruit is ſtrong, and even better than that of the preceeding ſpecies. A third ſort of *morillon*, which the French diſtinguiſh by the appellation of *franc morillon*, *lampereau*, and *beaune*, bloſſoms earlier than the others, and yields eqnally good wine. The wood of this is black, as is alſo it's fruit, which promiſes greatly whilſt green, but above half of it is generally loſt before it attains to a proper maturity. This vine runs into wood more than either of the former ſorts, and it's joints are farther diſtant from each other.

There is alſo a *white morillon*, which is excellent to eat, but it's ſkin is harder than that of the common black *morillon*; and there is likewiſe, of this ſpecies, the Orleans *grey auvernat*.

2. The *chaſſelas*, otherwiſe called *muſcadet*, or *white bar-ſur-aube*, is a large, white, and excellent grape, either for eating, for keeping long, for drying, or for making good wine. It's berries do not grow cloſe together; and it is peculiarly fit for ſtony vineyards, becauſe it ripens there the moſt eaſily. There is another ſort of *white bar-ſur-aube*, a ſpecies of the large *corinth*, which will be ſpoken of hereafter.

The black *chaſſelas*, known in Provence and Languedoc by the name of the Greek grape, is ſcarcer than the white; and ſo is alſo the red, the berries of which are likewiſe bigger. Both of theſe are excellent.

3. Almoſt all the *muſcat* grapes are exquiſite.

The *white muſcat*, or *Frontignan*, has long, thick, and very cloſely cluſtered bunches. It is excellent for eating, for preſerving, for making wine, or for drying in an oven or by the heat of the ſun. As the berries of theſe grapes are very ſmall, and grow extremely cloſe together, they ſhould, eſpecially where it can be done with moſt eaſe, be carefully thinned early in the ſeaſon, that the ſun and air may not be hindered from entering them, and that they may not be rotted by the moiſture which would otherwiſe be detained.

The *early white Piëmont muſcat*, which deſerves ſingular eſteem, has longer bunches, leſs cloſely cluſtered, and more unctuous.

The *red* or *coral muſcat*, ſo called from the livelineſs of it's colour, has the ſame qualities, it's berry is yet firmer, and requires a pretty deal of ſun to ripen it well.

The *black muſcat* is larger, and grows extremely cloſe. It has not ſo high a flavour: but it is very ſugary, and is much eſteemed, becauſe it is a great bearer, and it's fruit ripens pretty early.

The *purple muſcat* is of a leſs deep colour, and bears very large bunches, which are well garniſhed with large high flavoured berries. This, and the *red*, yield the moſt vinous juices of all the ſorts of muſcats.

The *malmſy muſcat* will be ſpoken of under the head of malmſy grapes.

The *ribezatte muſcat* has a pretty ſtrong flavour of muſk: it's berry is ſmaller than that of the other ſorts, and it's juice is ſo ſweet and agreeable, that it would be accounted one of the firſt of grapes, if it was leſs apt to ſhed it's bloſſoms *, and alſo, if it was leſs apt to degenerate.

The *long muſcat*, or *paſſe-muſqué* of Italy, has very long and big bunches of large oval berries, hanging ſomewhat looſe. This is ſcarce, and does not ripen without a great deal of heat; though, if it be but half ripe, it is the beſt of all grapes to preſerve for a ſweet-meat; the fire exalting that fine flavour in it, which the ſun had not time, or power to perfect.

The long *purple muſcat*, which ſome call the *Madeira* grape, is rare; but uncommonly beautiful and good.

There is likewiſe the *Jeſus muſcat*, the berries of which are very large and round. This has a very high perfumed flavour, and is extremely ſcarce.

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* The conſequence of a vine's ſhedding it's bloſſom is, that what would otherwiſe become a bunch of grapes, turns into tendrils, or claſpers. *Maiſ. ruſt. Tom.* II. *Part.* 3. *Liv.* 6. *c.* 6.

The *gennetin*, otherwiſe called the *Orleans muſcat*, belongs alſo to this ſpecies of grapes. It is very ſugary, apt to ſhed it's bloſſoms, and reſembles the *melié*, or rather the malmſy; for which reaſon ſome call it likewiſe the white malmſy. The dealers in wine at Paris often ſell the gennetin wine for the true muſcat of Frontignan.

4. The *black corinth*, or, as it is vulgarly called, the *currant* grape, is ſugary and delicious. It's berries are round, very ſmall, and cloſely cluſtered on the bunch, which, for it's thickneſs, is rather long; and they have not any ſtone.

The *purple corinth* is a little bigger than the black; like which it is an excellent fruit, and has no ſtone; but it is very apt to ſhed its bloſſoms; for which reaſon it ſhould be pruned longer than other vines.

The grape *without ſtones* is a ſort of white *bar-ſur-aube*, but it's berries are ſmaller, and ſomewhat tarter. It it very fit for drying, becauſe it has not any ſtones; for which reaſon it is often called the *large corinth*, or *currant*[*].

It

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[*] As dried grapes, whether of the large ſort, which are then termed *raiſins*, or of the ſmaller, which are called *currants*, may undoubtedly, and with great eaſe, be rendered a branch of trade very profitable to ſeveral of our colonies; I ſhall here tranſcribe, from Mr. Chamber's *Cyclopædia* (Art. CURRANTS), Sir George Wheeler's account of the manner in which the people of the Archipelago prepare and pack up the *currants* of which we import annually great quantities from thence.

They gather theſe grapes in Auguſt, ſpread them in layers on the ground till they are dry, then clean them, and lay them up in magazines, which the natives call *ſeraglios*; pouring them in at a hole, till the magazine is full. They cling ſo faſt together by their own weight, that they are forced to be dug out with iron inſtruments. To barrel them for ſending abroad, they have people who greaſe their feet and legs, and tread them cloſe, that they may keep the better. When thus packed, or when made up in bales, they may be kept two or three years, without ſtirring, or giving them air.---The iſland of

It is to be obſerved, that all the *muſcats* and *corinths*, being apt to ſhed their bloſſoms, ſhould be pruned long, or grafted upon the *bourdelais*, when it is not deſired they ſhould have a ſtrong muſky flavour.

5. The *malmſy* grape is of a greyiſh colour, and the vines which produce it are great bearers. It's berries are ſmall, but very ſugary, high flavoured, early ripe, and ſo full of juice, that, like the Orleans gray auvernat, it is reckoned one of the moſt melting grapes. The *red malmſy* is of a flame colour, and has the ſame qualities as the ſort before mentioned. The *white malmſy* is ſcarcer, and ripens leſs early. The *grey malmſy* is the moſt uſed, and generally thought to be the beſt of the three.

There is likewiſe the *muſked malmſy*, otherwiſe *muſcat de malvoiſie.* It comes from Mont-ferrat: the country around Turin is full of it; and it's flavour of muſk is higher than that of any other grape.

6. The *bourguignon*, or *treſſeau*, is a pretty large black grape, better to make wine of, than to eat. The vines of this ſpecies bear moſt plentifully, and their branches are of a good ſize.

The *white bourguignon*, called in ſome places *mourlon*, and in others the *clozier*, has joints at the diſtance of two fingers and an half broad from each other, it's fruit grows on a ſhort ſtalk, it's bunches

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of Zant produces every year currants enough to load five or ſix veſſels; Cephalonia three or four, and the other iſlands one. The Engliſh have a factory at Zant; the Dutch two or three merchants, and the French one: the Engliſh conſuming more than ſix times the quantity that both France and Holland do together.

The ſame method, or ſo nearly the ſame that the difference is no way material, is practiſed in Spain for making raiſins; and if the heat of the ſun be not alone ſufficient to dry the fruit, an oven may be uſed. The beſt are, however, thoſe which have been dried by the ſun only.

bunches are cloſely cluſtered, it's leaf is very round, like that of the *gouais*, and it endures froſty weather.

The *noiraut*, or *black grape*, otherwiſe called the *dyer*, or *Spaniſh plant*, is another ſort of black *bourguignon*. It's wood, like that of the former, is hard and very black; the pith of this wood is ſmall and compact; it's joints are ſhort; it's leaf has a red ſtalk, is of the middle ſize, and quite round. It reſiſts the froſt better than any other vine; but it's juice is very flat, and ſerves only to give a deep colour to the wine it is mixed with; for which reaſon a few, and but a few, of theſe vines are planted in each vineyard that is to produce red wine. It is alſo good for wounds. The dyers give a great price for the wine that is made of this grape, to dye their cloths with.

7. The *bourdelais* is of three ſorts, *viz.* white, red, and black. It's bunches, and their berries, are very large. It is uſed chiefly to make verjuice, and for ſweet-meats. It is likewiſe an excellent ſtock for grafting all ſorts of grapes, eſpecially thoſe that are apt to ſhed their bloſſoms, ſuch as the Damaſcus, the corinths, and particularly the purple kind of this laſt ſpecies. The muſcats may alſo be engrafted on it, and ſo, in ſhort, may all other vines.

The *Apricot* grape, the *Greek vine*, and the *farineau*, are three ſpecies of the *bourdelais*.

The *apricot* grape is ſo called, becauſe it's fruit is of a golden yellow, like the apricot: it's bunches are beautiful, and very large.

The *Greek vine*, likewiſe called the *marvellous* grape, and the *St. James of Galicia*, becauſe that part of Spain is full of it, is red, bears large, round, and ſweet berries, which ripen early, and make good wine. It produces very large and beautiful bunches; and when the fruit is ripe, it's leaves become ſtreaked and bordered with red, as is frequently the caſe of all vines whoſe fruit is variegated with black, purple, and red.

The *farineau*, or *rognon-de-coq*, as ſome call it, is white. has ſome long berries, and is fitter to make verjuice than wine.

8. The *ſans-moireau*, which the people about Auxerre call *quille de-coq*, is a black grape, excellent for eating and for making wine. It's berries are ſomewhat long, firm, and cloſely cluſtered. There are three ſorts of this vine: the wood of the firſt and beſt is hard, and has ſhort joints; the ſecond is very like the firſt; and the third, called the *ſans moireau chiqueté*, or *white prunelas*, becauſe it has whiter wood than the others. It yields but a flat wine, bears only in ſome years, and it's berries are apt to drop off entirely before they are fit to be gathered.

The *red prunelas*, or *negrier*, has a red rind, long jointed wood, thick pith, a jagged leaf, and bears large bunches of tranſparent and very red grapes. It is one of the lateſt ripeners, and yields a laſting, but rough wine; for which reaſon a few only of theſe plants are ſet in vineyards of black grapes; but juſt enough to deepen the colour of the wine, and to give it a body. It reſiſts froſt, becauſe its ſtem is tall and ſtrong.

9. The *white melié* is one of the beſt of grapes for making wine, and for eating. It yields greatly, and has a good juice, which keeps pretty well. It is an excellent fruit for drying.

The *black melié* is neither ſo well taſted, nor ſo vinous, as the white.

The *green melié*, which ſome call only the *green plant*, is the moſt eſteemed of this ſpecies of grapes, becauſe it yields greatly, does not ſhed its bloſſoms, and the wine made of it never turns yellow.

The *ſurin* is a ſpecies of the *melié*. It's berries are ſomewhat oblong, and a little pointed. The fruit of this vine has an excellent flavour, and is greatly liked in Auvergne.

10. The *gamet* is a very common grape, yields plentifully, and grows more eaſily than any other: but it affords only a very weak wine, which has but little flavour; nor does this ſort of vine laſt many years. There is a *white gamet*, and a *black gamet*.

11. The *gouais* is likewiſe very common. One ſort of it is white, and another purple, with a bloom, like that on plums. It's vine will laſt an hundred years in the ground. It bears larger and longer bunches than the *gamet*; but, like it, has too poor a juice to make good wine. It is even inferior to the *gamet* in this reſpect: but it makes excellent verjuice, and fine ſweet-meats. Very few, if any, of this ſpecies, ſhould be left in a vineyard.

12. Beſides theſe eleven moſt general ſorts of grapes, there are many others, which, though leſs uſually ſpoken of, ought to be known.

The *beaunier*, ſo called becauſe it is very common and much eſteemed at Beaune, is a grape which yields greatly, and has ſome reſemblance to the *white gouais*.. At Auxerre, it is called the *ſervinien.*

The *fromenteau* is an exquiſite grape, and well known in Champagne. It is of a grey red, grows in pretty large bunches, which are very cloſely cluſtered, has a tough ſkin, an excellent juice, and makes the beſt of wine. It is to this grape that the famous wine of *Sillery* owes it's merit and renown.

The *ſauvignon* is a black grape, pretty big and long, very high flavour'd, and exceedingly good. There is alſo a *white ſauvignon*, which has the ſame qualities as the black: but both of them are ſcarce, and not much known.

The *pinquant-paul* is a very ſweet white grape. It is likewiſe called the *bec-d'oiſeau*, or *bird's bill*, and in Italy, *pizutelli*, *pointed*, becauſe it's berry, which is large and very long, is pointed at each end.

There is alſo the *purple pizutelli*, otherwiſe called *dent-de-loup*, or *wolf's tooth*, which has likewiſe a long berry, but leſs pointed. It is one of the plumpeſt and moſt beautiful of grapes, and yields a pretty good juice, which will keep for a long time.

The grape which the French call the *gland*, becauſe it is ſhaped like an acorn, is of a deep yellow colour, very ſweet and keeps well.

The *blanquette de limons*, is a white grape, tranſparent as glaſs. It's bunch is long and pretty big: it yields greatly, and it's juice is very ſweet and delicious.

The *white robe*, and the *black robe*, yield alſo plentifully. Their bunches are thick and long, their berries ſmall, and very cloſe together; but, being a ſpecies of the ſmall *bourdelais*, they do not ripen eaſily.

The *Alicant vine*, commonly called the *great black Spaniſh*, bears bunches of very large berries, which are good to eat, and ſtill better to make the wine ſo vaunted in Spain; uſually called *Tent*, in this country.

The berries of the *African* grape are as big as plums, and the bunches of them are proportionably large. Theſe berries are rather long than round, and ſomewhat flat towards the point. The wood of this vine is very thick, and it's leaf very large. The aſſiſtance of a wall, and a great deal of ſun, are neceſſary to ripen this fruit thoroughly.

The *morocco*, or *barbarou*, is a large purple grape, the bunches of which are alſo of an extraordinary ſize. The berries are big, round, and hard, the wood reddiſh, and the leaf ſtreaked with red. Some vines of this ſpecies yield amazingly, and bloſſom three times a year.

The *Damaſcus* grape is likewiſe excellent to eat; its bunches are very big and long, its berry very large, long, and of an amber colour. It has but one ſtone, and is very apt to ſhed its bloſſoms; for which reaſon it ſhould be pruned long. There is a white ſort, and a red ſort, of this grape.

The *Italian* grape, otherwiſe called *pergoleze*, is of two ſorts, *viz.* the *white* and the *purple.* Its bunches are large, and the berries long and looſe ſet; but they require a conſiderable degree of heat to ripen them.

The *Mantuan* vine yields a very early fruit; for it ripens in the beginning of Auguſt. Its bunch is pretty large, and it does not ſhed its bloſſoms: the berries too are pretty big, rather long than round: they are of a fine rich amber colour, and contain a very vinous juice.

The *Auſtrian* vine, or *cioutat*, has a leaf divided like that of parſley: its fruit is white, ſweet, yields well, and reſembles the *chaſſelas*; but its juice is not vinous.

The *Swiſs* grape is rather curious than good. Its bunches are thick and long, and their berries are variegated with black and white, ſometimes in ſuch manner that one half of a berry is of one of theſe colours, and the other half of the other.

A ſhort recapitulation of the above-mentioned different ſorts of grapes, will at once ſhew what each of them is fitteſt to be planted for.

### *Grapes proper for the Garden.*

The *cioutat*; the *black* and the *white chaſſelas*; the *white*, the *black*, the *red*, the *long*, and the *muſky muſcat*, with the early *Orleans muſcat*, commonly called the *gennetin*; the *corinth*, ſmall or large, red or purple; the *malmſy*, gray or red; the *Italian*, the *African*, the *Damaſcus*, the *Morocco*, the *apricot*, the *white robe*, the *melié*, eſpecially the white; and the *Bourdelais*.

### *Grapes proper for the Vineyard.*

The *pineau*, or *Auvernat*, the *gray Auvernat*; the *white morillon*, and the *morillon taconné*; the *gennetin*; the *pinquant-paul*, the *beaunier*, the *treſſeau*, and all the *bourguignons*; the *bourdelais*, the *Swiſs*, the *Spaniſh black*, or *Alicant*; the *ploqué*, the *ſans-moireau*, or grape without ſtones, the *negrier*, the *fromenteau*, the *blanquette de limons*, and moſt of the garden grapes, eſpecially the *melié*, the *white robe*, the *black* and the *red muſcat*, and the *chaſſelas*. A few plants of the *gouais* may alſo be intermixed with them.

### *Grapes proper for making Verjuice.*

The *farineau*, the *white* and the *purple gouais*, and the *white* and the *black gamet* *.

## *ARTICLE* X.

### *Vines fitter for ſome Soils, than for others.*

WHEN a vineyard is planted in a ſtrong ſoil, it ſhould conſiſt of *morillons*, otherwiſe called *white* and *black pineaus*; but there ſhould be more of the latter than of the former, and they ſhould be intermixed with *treſſeaus*, otherwiſe called *Burgundy* grapes.

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* It is proper to obſerve, that if the grapes of which verjuice is to be made are too ripe when they are gathered, their juice turns to water; and if they are gathered when too green, it is often productive of bad conſequences: there is therefore a proper medium between theſe two extremes; and that medium depends chiefly on the year's being forward or backward. Thoſe who are uſed to gather grapes for this purpoſe, know exactly when they are fit to be cut off the vines.

When large quantities of this liquor are made, the grapes are ſqueezed in a preſs; ſuch as is uſed for making oil. The whole art of preſerving it for many years, conſiſts in keeping the veſſel cloſely ſtopped, and putting into it a little ſalt. Two pounds of ſalt are ſufficient for a hogſhead of verjuice. *Maiſon. ruſtique*, *Part*. 4. *Liv*. 4. *c*. 2.

The *pineau* does not attain to its full perfection in ſtrong lands, though the ſeaſon be never ſo hot: for, notwithſtanding all the help that can be given it in ſuch a ſoil, it ſtill wants that undefinable *ſomewhat*, without which no grape can yield a delicate wine: whether it be, that, in imbibing its nouriſhment from the earth, its juices retain a portion of the moiſture which is natural to that earth, and which blunts the ſpirits of the wine; or that, as experience has ſhewn in very many caſes, though the heat be as great as poſſible, a ſtrong ſoil does not yield to the grape that ſort of juice which acquires a fine high flavour, and a racy vinous quality, by fermentation.—Thus, it is known from facts, that the *Madeira* grape planted in a rich valley, no longer yields the ſame wine it does on its native rock.—Yet the *pineau* is the only grape that ſhould be planted in a ſtrong land; becauſe it ripens earlier than others, and always yields a ſure crop.

If ſome plants of the *treſſeau*, whoſe fruit never ripens eaſily, are mixed with the *pineaus*, it is, ſay the authors of the *Maiſon ruſtique* *, becauſe our forefathers, having found by experience that the *pineaus* cannot of themſelves yield in ſuch a ſoil, wine which has a ſufficient body to keep long, judged it neceſſary to add theſe *treſſeaus*, which, though they ripen very ſlowly, never fail to yield that ſort of wine which, without being ſpirituous, is, on the contrary, thick and heavy, which is the ſtate it ſhould be in when produced by ſtrong land, in order to its becoming good.

In a ſandy ſoil, whether it be coarſe or light, *pineaus*, and eſpecially the white ſort, are the vines moſt proper for planting. The *meunier*, or *miller* grape, delights in light ſands; and coarſe ſands agree with the *meliés*, otherwiſed called *melon* grapes, whether theſe be white, black, or green. In the diſtrict of Auxerre, theſe ſands, though naturally warmer than the ſtrongeſt land, do not, for all that, yield equally good wine: (theſe ſtrong lands are here ſuppoſed to be ſuch as were before adviſed, and their expoſition good.) This is what experience teaches us daily with regard to ſands, which, furniſhing no rich nutriment to the vine, yield only grapes whoſe juice is flat and inſipid, and not ſo ſugary as thoſe of ſtrong lands.

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* *Tom.* II. *Part.* 3. *Liv.* 6. *c.* 1.

To theſe *pineaus* are therefore joined the *meliés*, as before ſaid. The white *melié* is a good grape, and yields greatly: the black is leſs ſo. Theſe ſorts of grapes become excellent (ſo far as their nature permits) in theſe ſands, which, being much warmer than they are ſubſtantial, ſuit the nature of the *meliés*, which require a great heat to ripen them. Theſe grapes yield a wine which is not apt to turn yellow.

Upwards of two thirds of the vines planted in ſuch ſands, in France, are thoſe of white grapes; becauſe it is the cuſtom of thoſe places to make more white wine than red.

A reaſonable proportion of the *treſſeau* grape ſhould always be planted with the others in ſandy ſoils: not that it ever attains to perfection there; but that, by mixing it with thoſe other grapes, whoſe juice acquires only a moderate ſweetneſs in ſuch ground, they may be enabled to yield wine which has a good body.

As to ſtony lands, thoſe which abound in blackiſh and large ſtones, and of which the earth is reddiſh and ſomewhat moiſt, muſt be treated in the ſame manner as ſtrong ſoils.

Thoſe which have ſmaller and white ſtones, and of which the earth is leſs red, are better than the former. Beſides the white and the black *pineaus*, and a ſmall number of *treſſeaus*, theſe lands are planted with the *beaunier*; and all theſe grapes do well on them.

Stony land whoſe ſoil is yellowiſh, and where the ſtones are yet much leſs than the preceeding, are ſtill better than them for the laſt mentioned ſorts of grapes: for theſe do ſo well in a ſoil of this kind, that they always yield there a wine which is at leaſt pleaſant. They may be intermixed here with a few plants of *muſcats* and of *chaſſelas*: for theſe will acquire maturity enough to be of ſervice to the others, and will help to make their wine keep the longer.

Stony lands, which have otherwiſe a mellow and good ſoil, yield the beſt and fineſt flavoured wine when they are planted with *pineaus*; and in this caſe the number of the white grapes of this ſpecies ſhould greatly exceed that of the black. Thoſe from which the grayiſh wine, commonly called *partridge's eye*, is deſired, ſhould be planted chiefly with *ſerviniens*, and here and there a few *muſcats* and *chaſſelas*; but no *treſſeaus*.

When ſuch lands as theſe are intended for red wines, they ſhould be planted with more black *pineaus* than white, with ſome *ſerviniens*, and with a few *treſſeaus*. Theſe will yield a ſtrong and mellow wine.

I cannot cloſe the ſubject of the culture of the vine better, or in a more inſtructive manner, than with the following experiments, for which we are indebted to two gentlemen, of whoſe ſuperior underſtanding in matters of husbandry, as well as of their indefatigable zeal for the welfare of mankind, we have already ſeen repeated proofs in ſeveral parts of this work.

## *ARTICLE* XI.

## EXPERIMENTS ON THE CULTURE OF THE VINE.

### *Extract of a Letter from* M. Rouſſel *in* Brie, to M. Du Hamel, *written in the year* 1755[*].

"I Have begun to try the new huſbandry upon the vine. It is hard to pay at leaſt 120 livres (five guineas) a year, for dreſſing an arpent (about an acre and one fifth) of vineyard, to have only our poor Brie wine; eſpecially when the vines are entirely frozen, as they were laſt year, or laid bare to the very wood, by hail, as was the caſe in Auguſt laſt. I am therefore trying to find out a way to manage vines, without being at the expence of dreſſing, or propping them, and by which they may be leſs expoſed to the injuries of the weather, and leſs liable to be plundered by thieves. To this end, I pitched upon a ſpot of ground, about half an arpent in extent, which had formerly been a vineyard, but was grubbed up many years ago. I planted on it 400 poplars, ſix feet aſunder, in a quincunx form. As the roots of this tree are few and ſmall, I thought that diſtance might be ſufficient. At the foot of each of theſe trees, I planted two vine cuttings, one on each ſide. The alleys are plowed, in order to their being ſown alternately, with corn, or pulſe, ſuch as lentils, beans, barley, oats, *&c.* the produce of which pays the expence of plowing. While the three feet on one ſide of the tree are ſown, the three feet on the other ſide are plowed, at proper times and ſeaſons; by which means, both ſides of the tree, and conſequently both the vines, receive in turns the benefit of the ſtirring of the ground. All my plants have taken well. I intend to let the vines run up the trees, without doing any thing to them; and ſhall wait with patience the event of their produce, which, be it more or leſs, will be ſo much clear gain, as it will not have coſt me any thing. This method was immediately approved of by the country people hereabouts, ſeveral of whom are now following my example. What helped to give them this good opinion of it, ſo ſuddenly, was, the example of a vine, which chances to grow a league from hence, in the middle of a field, at the foot of a pear tree, and which never is either pruned or cultivated. Laſt year, when all the vines of this country were ſo damaged by the froſt, as not to produce any fruit at all; this vine eſcaped unhurt, and bore as many grapes as yielded a barrel of wine. If the future produce of my vineyard, which contains 800 vines, were to be eſtimated on this footing, it would amount to 800 barrels of wine every year. But as no one can be ſo abſurd as to make ſuch a calculation; ſo, on the other hand, I believe none will deny but that my vines, producing only the two hundredth part of that proportion, will yield me four barrels of wine, which will not have ſtood me in the leaſt extraordinary charge. And even ſuppoſing them not to yield me any thing, ſtill I ſhall loſe nothing, becauſe they will have coſt me nothing. The 400 poplars, which do not ſtand me in above a penny a-piece, (being planted only by ſlips, without making or digging either holes or trenches for them,) cannot fail, in a ſoil that is quite fit for them, to be worth, twenty-five years hence, 10 livres (8*s.* 9*d.*) a piece, or 4000 livres (175*l.* 4*s.*) the whole; which will be an excellent payment for the ground they will have taken up. I do not, however, mean to extend this method to all my vineyards. In moſt of them, the ſoil, though fit for the vine, is too dry and ſtony for the poplar. In Italy, vines are frequently planted at the foot of mulberry and other trees. The only thing neceſſary in that caſe, is, to make the alleys of a breadth proportioned to the ſhade of the trees."

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[*] *Culture des Terres, Tom.* V. *c.* 1.

### *Experiment on the Vine, cultivated according to the Principles of the New Husbandry, with remarks thereupon, by* M. de Chateauvieux *.

" WHEN I began to reflect attentively on the principles of the new husbandry, I ſoon perceived that it might prove a means of perfecting the culture of our vineyards, as well as that of our other lands.

" I was the more readily induced to turn my thoughts towards that important branch of agriculture, as it ſeemed to me to have been too much neglected for a long time. I plainly ſaw, that our methods of cultivating the vine were, in general, not only defective, but badly executed, and that, in the common way of planting vineyards, the produce could not be proportioned to the great expence.

" I ſhall not at preſent enter into a detail of the principles and motives of my new ſcheme for the culture of the vine: that taſk would be too long for this narrative: and I ſhould likewiſe be glad firſt to ſee the advantages of my method confirmed by a ſeries of experiments repeated for ſeveral years together. My different operations, and firſt ſucceſs, are all that I ſhall mention now.

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* Duhamel, *Culture des Terres, Tom.* V. *c.* 5. *p.* 548.

" Every country has in the culture of the vine, ſome practice or other peculiar to itſelf, and which is thought eſſential there, though it be rejected in other places. All agree in pruning the vine, and in ſtirring the earth around it: but neither of theſe operations is performed in the ſame manner every where.

" For the better underſtanding of my new culture, it is neceſſary that I ſhould give an idea of the manner in which our vineyards are laid out and planted. Their expoſition is generally to the Eaſt or South, on a good deep ſoil, which has a gentle declivity, or on the ſide of a hill. The whole ſurface of the ground is planted without order or ſymmetry; ſo that the vines are, almoſt always, either too cloſe together, or too far aſunder: very few are at proper diſtances. As the old vines decay and periſh, the chaſms are filled up by layers from the next neighbouring vines. This is the general diſpoſition of our vineyards, from which great inconveniences muſt neceſſarily ariſe: but I ſhall not enter into that detail.

" With regard to the culture of the vine, it is ſufficient, for my preſent purpoſe, to obſerve, that the whole of that labour is now performed by hand, which renders it very expenſive. I ſay nothing of the manner in which it is executed; that part having appeared to me ſo very defective, that I have been obliged to alter and correct it in every point.

" By this ſhort preamble it may eaſily be ſeen, that, in order to improve the culture of the vine, and bring it to greater perfection, it was neceſſary that I ſhould attend chiefly to the three following things. 1. To diſpoſe the vines in a better manner, by planting them in ſtrait lines, and at equal diſtances from each other. 2. To contrive that diſpoſition ſo as to leſſen the preſent expence of culture, by uſing a plough to ſtir the ground in one part of the vineyard, whilſt the other ſhould continue to be ſtirred with the ſpade. 3. To execute the ſeveral cultures of the vine, in ſuch manner as to make them promote its vegetation more than they do in any of the common methods.

" I ſhall treat each of theſe articles ſeparately.

### " I. *Of the diſpoſition of the Vines in the vineyard.*

" THE diſpoſition which ſeemed to me the moſt agreeable to the principles of the new huſbandry, by which I was guided, was to lay the vineyard out in beds, as we do fields for corn, obſerving to leave an alley between every two beds, and making each bed five feet wide, in order to plant it with three rows of vines, which, by that means, would be 30 inches aſunder, and the vines at the ſame diſtance from each other in the rows.

" As to the alleys, I thought it would be right to make them alſo five feet wide: and what I ſhall ſay hereafter will ſhew, that about that breadth is neceſſary.

" However, as that diſpoſition might not be the beſt, I tried others on ſmall ſpots of ground, by planting the vines at other diſtances. Some were ſet in ſingle rows three feet and an half aſunder; others in double rows, and in beds, with alleys of three feet and an half between them. Theſe plantations were made in the ſpring of 1753.

" But as I could not expect to ſee the event of theſe trials till a conſiderable time after making them; eight or ten years, at leaſt, being requiſite to ſhew what the ſucceſs would be, when the vines ſhould become to their full ſtrength and bearing; I conſidered at the ſame time, by what means I might abridge an experiment which was to be of ſo long duration.

" To that end, I formed a bed of vines in a vineyard planted 24 years before. The vineyard was good, and yielded plentiful crops. I made my bed five feet wide, and planted it by laying down ſtocks of the old vines, to make the two outward rows, leaving two feet and an half diſtance from one layer to another. The old vines, which happened to be pretty well ſituated, formed the middle row. The remainder of the bed, which is 240 feet long, was planted with layers.

" An alley, five feet wide, was made on one ſide of this bed, by pulling up the old vines within that diſtance. Some of theſe which were left, ſerved to form a row of vines, ready againſt the making of a ſecond bed parallel to the firſt. It is plain, that the making of a bed in this manner, requires a breadth of ten feet, *viz.* five feet for the vines, and five feet for the alley. This bed was thus made in November 1752.

" After I had ſeen the crop which it produced in 1754, I no longer heſitated to extend this experiment: and accordingly, in November of that year, I made three other beds, like the former, and cloſe to it.

" I not only made no doubt but that the vines, being ſo diſpoſed, and having an equal quantity of earth to draw their nouriſhment from, would thrive better than they do in our common method of cultivating them; but I likewiſe hoped, that their being expoſed on all ſides to the influences of the ſun and air, by means of the alleys, would facilitate their vegetation, and haſten the ripening of the grapes.

### " II. *Of the importance of leſſening the expence of culture, by the new diſpoſition of the vines.*

"THIS article will be of no great conſequence to thoſe who are already uſed to cultivate their vineyards with the horſe-hoe: I write it for thoſe only who are not acquainted with that practice.

" The manner in which I propoſe diſtributing the vines, ſhews at once the poſſibility and facility of giving the alleys every neceſſary culture, with the ſame plough and the ſame cultivator as we uſe for the alleys of our corn fields. I have not found the leaſt difficulty in the execution of this practice.

" The ground thus cultivated in the alleys, will be about a third part of the whole: the remaining two thirds will continue to be cultivated by hand, as uſual; and the expence will be conſiderably diminiſhed, by the diſpatch with which the plough, or cultivator, will perform its part.

" The plough may be brought as near the vines as one pleaſes, provided care be taken not to damage them. An expert huſbandman will eaſily know how to manage in that reſpect.

" Another diminution of the expence attending the common culture of vineyards is, that as, by the method which I propoſe, the number of vines will be fewer, they will of courſe require leſs labour, and therefore leſs coſt; and the vine-dreſſers, meeting with no hinderances or obſtructions between the vines planted regularly in rows, will do more work in a day, and that much better, than in the old way. There will alſo be leſs occaſion for many things neceſſary to the vine, ſuch as propping, tying up, dunging, *&c.* Conſequently this new culture will prove a conſiderable ſaving.

" It is well known how much vines are hurt when too great a quantity of water is retained in the ground. It chills them too much, their juices become leſs exalted, numbers of weeds ſpring up, *&c.* Theſe inconveniences will be remedied in a great meaſure, by means of the alleys, by cutting with the plough, as I have done, towards the beginning of winter, a furrow along each ſide of the bed. The water will drain off into that furrow, and the bed will retain only the degree of moiſture neceſſary for the vines.

### " III. *Of the means of rendering the culture of the vine more beneficial to the plant and to its fruit.*

" I Shall ſpeak only of the two principal parts of the culture of the vine, *viz.* the pruning of it, and the ſtirring of the ground; and the time when each of theſe ought to be performed.

" Before I began to execute the alterations I had thoughts of making in this culture, I had endeavoured to make myſelf ſo far maſter of it, as to be the leſs in danger of miſcarrying in my experiment.

" The cuſtom of this country is, to prune the vine during and after winter; frequently beginning that work about the end of January. I always thought that a wrong ſeaſon; and judged that it would be much better to prune the vine before winter, immediately after the vintage is ended. Experience has ſince ſhewed me that I was right.

" In November 1750, I pruned above fifty vines with my own hands: none of them ſuffered in the leaſt by the winter's froſt: they made ſtrong and vigorous ſhoots, and produced a greater quantity of grapes than any of the neighbouring vines.

" The next year, and in the ſame month, I pruned the ſame vines again. This pruning had the ſame ſucceſs as the year before. Encouraged by this repeated experience, I determined to make the bed before mentioned, in my old vineyard. The vines have continued to be pruned before winter, always with ſucceſs, and without any ſort of inconvenience.

" Satisfied with theſe firſt trials, I thought I might ſafely venture to extend the ſame practice to a larger extent of ground. I had about three acres of vines, which had produced very little wood for two years paſt. Their branches were ſo poor and ſlender, that they would ſcarce bear laying down: in ſhort the vineyard periſhed daily. I conceived hopes of recovering it by means of this pruning. Accordingly, I pruned it in November 1754; and in 1755, the vines produced ſtronger and longer ſhoots. As the branches would then bear laying down, I began to repleniſh part of the vacant places. By this means, my vineyard was replanted with young vines, and quite renewed, only by altering the time of pruning.

" This laſt pruning underwent a ſevere trial, from the exceſſive hard froſts of the winter of 1755: yet, intenſe as the cold was, my plants bore it, without being hurt at all. I then looked upon it as certain, that the vine might be pruned before winter, without any danger from the inclemency of that ſeaſon.

" It was abſolutely neceſſary that the vine ſhould bear pruning at that time, in order to enable me to perform the other cultures in their proper and moſt favourable ſeaſons.

" That the vine may be benefited as much as poſſible by every ſtirring of the earth about its roots, theſe ſtirrings ought certainly to be performed

formed at the times when they may be moſt likely to excite the greateſt vegetation. Let us ſee whether the common practice anſwers that end. The uſual time of beginning to dreſs the vineyard is in the ſpring, immediately after pruning the vines. Three dreſſings are judged ſufficient; and it is generally thought, that the laſt ſhould be finiſhed by midſummer. The plants are then left to ſhift for themſelves, till the time of vintage, which is upwards of three months after. During this time, quantities of weeds generally ſhoot up, which ſhade the vines, and hinder the grapes from ripening as they ought. Careful husbandmen pull them up: but the greater part are unwilling to take that trouble.

" In the common way of cultivating the vine, the earth is firſt ſtirred when the buds are juſt ready to come out, and even after they are come out; a time always extremely critical, becauſe the uncertainty of the ſeaſon expoſes the buds to ſeveral dangers, which are increaſed by that ſtirring of the earth, from whence many exhalations, oftentimes very pernicious, proceed at this ſeaſon. Would it not be much better to let the vineyard reſt while the vine is budding?

" The laſt ſtirring, which is given about midſummer, is too long before the vintage, and therefore is almoſt always followed by great quantities of weeds. Might not this laſt culture be performed later?

" I have experienced that theſe inconveniences may be avoided, without falling into others. To this end, after the vine has been pruned, before winter, let the earth be firſt ſtirred in that ſeaſon: the ſecond ſtirring, which would otherwiſe be immediately after winter, may then be deferred till towards the end of May: and the third ſtirring may be given in the beginning of Auguſt, or about the end of July.

“ This has been my method of cultivating my vines, ever ſince their being planted in beds. The beds are dug by hand, and the alleys are ſtirred with the plough or the cultivator.

“ The firſt ſtirring before winter produces the ſame effect on the vineyards, as it does on our beds of corn. The water is drained off, and the winter's froſts penetrate the earth, divide it, and keep it looſe and light.

“ It remains in this ſtate till towards the end of May, when it receives the firſt ſtirring after winter: and, to have a more certain rule to go by, the ſecond ſtirring ſhould not be given till after the props have been ſtuck, the vines have budded, and the ſhoots have been tied up to the props. This ſtirring may be given, either a little ſooner, or a little later, than is mentioned above, according to the ſeaſon. Sometimes one may be obliged to haſten it, if the ground is greatly burdened with weeds: but at whatever time it be performed near the end of May, it is certain that the vine will then have made great ſhoots, and that without having been diſturbed by any ſtirring of the earth during the time of it's tender vegetation. As I have tried this culture in hot and very dry years, I have ſeen that the earth has not grown hard, but has retained the neceſſary degree of moiſture, ſo as to be ſtirred with the greateſt eaſe.

“ The third ſtirring, which is the ſecond after winter, being deferred till towards the end of Auguſt, or at leaſt till the end of July; weeds have not time to grow in any quantity between that and the ſeaſon of the vintage: and what will render it ſtill more beneficial, is, that this is the time when the grapes fill moſt, and are drawing towards a ſtate of maturity.

"I may perhaps be thought not to enlarge enough on ſo important a ſubject as this is. It will, I confeſs, require being treated more fully hereafter: but in the mean time I beg the reader to conſider, that I am now relating only the ſucceſs of my trials.

### "*Good effects of this culture proved by the produce of a bed of vines* 240 *feet long, planted in* 1752.

"I Obſerved, in the beginning of this account, that every culture of the vine is performed with much greater eaſe and expedition in vineyards laid out in beds, than in thoſe which are planted all over; but at random. The very ſituation of the vines planted regularly in beds, is ſufficient to ſhew with what eaſe every thing that they require may be done, and that they muſt, of courſe, be well cultivated in every reſpect.

"In the next place, the pruning of the vine, and the firſt ſtirring of the earth before winter, are done at a time when the buſineſs of the field is over, and huſbandmen are, in ſome meaſure, un-occupied. That time, which would otherwiſe be in a manner loſt, may now be employed to very great advantage; and in conſequence of their being advanced in their work before the coming on of winter, inſtead of being over-loaded in the ſpring, by a multitude of things to be done at that time, they will have ample leiſure to attend properly, and without being hurried, to every branch of culture that a farm requires.

"The effect of our culture has been extremely viſible. The new vines have grown ſo prodigiouſly, that they now greatly ſurpaſs thoſe of the old vineyard, which they were part of: the ſhoots too are thicker and longer, and the bunches of grapes bigger and more numerous.

" When I firſt began to apply the principles of the new huſbandry to the culture of the vine, I hoped indeed that the great fruitfulneſs of a ſmaller number of plants, might compenſate for the loſs of thoſe I was obliged to retrench: but I was agreeably ſurpriſed to find all the vines of my bed loaded with an equal quantity of grapes.

" Though my conjecture was founded on principles which I knew to be true, I was ſtill farther confirmed in my opinion by an obſervation I had made, that, even in our beſt vineyards, there are always great numbers of vines which abſolutely bear no fruit at all, and many others which produce but very little; ſo that it is not on the great number of plants that the great produce of the vineyard depends, but on the goodneſs of thoſe plants.

" Accordingly I concluded that I ought not to look upon my having taken up ſome vines in order to form the alley, as a loſs, provided thoſe in the bed were enabled by good culture to yield their utmoſt productions. The event ſhewed that I was right.

" I likewiſe judged, that the grapes would ripen more perfectly in this new way, than in the old: and in that too I was not miſtaken; for they were much higher flavoured, and made far better wine.

" Beſides theſe advantages, this culture preſerved my vines from a very bad accident, which happens frequently, eſpecially when the autumn is rainy: I mean, the rotting of the grapes. In our common vineyards, the grapes ripen, ſmothered beneath that quantity of leaves with which the vines are loaded, and ſurrounded by numbers of weeds, which often grow higher than the vines themſelves. Add to this, that the air around them is filled with various exhalations from the earth, which, for want of a free circulation, remain ſuſpended about the plants. Theſe cauſes cannot but make the grapes rot, and the wine that is made of them, muſt be greatly inferior to what it would otherwiſe be.

"Our vines in beds, being much leſs, if at all, liable to any of theſe accidents, will have the advantage of preſerving their grapes ſound and without rottenneſs, till they are perfectly ripe. This I have already experienced, at a time when above half the grapes of my old vineyard were abſolutely rotten.

"Notwithſtanding all the advantages of this new method, which, I may ſay, I have only glanced at; they would probably not be regarded, if they were not attended with greater fruitfulneſs than is obtained in the common way. I ſhall therefore ſhew, that the produce of my young vines was very conſiderable, and greatly ſuperior to that of my old vineyard.

"My bed, as I obſerved before, was formed in November 1752; and the two outward rows conſiſted, in a great meaſure, of young layers, which not being old enough in 1753, to bear much fruit, I could not expect any great matter from them that year. However, they bore as much as could reaſonably be deſired. A violent ſtorm of hail which fell in June, left ſcarce any thing to be gathered in all our other vineyards.

"The year 1754 produced, in general, but little wine. The young plants of my bed being then only in their ſecond year, were too weak to diſtinguiſh themſelves by any extraordinary quantity of fruit; though their vigour gave great hopes for future years. However, even in this, they were loaded with ſo many and ſo large bunches of grapes, that they yielded rather more wine than the old vines which were next them.

"The year 1755 was one of the beſt years for wine, that has been known for a long time. The quantity was plentiful, and the quality exceeding good. The youngeſt plants of my bed, which were only in their third year, ſeemed no way inferior to the old vines cultivated in the common way.

"This bed, 240 feet long, and ten feet wide, including the alley, yielded 336 pints of wine, Paris meaſure (84 Engliſh gallons) which was after the rate of two-fifths more than I had from my old vineyard; or to explain myſelf ſtill better, if my whole vineyard had been laid out in beds, it would have yielded five barrels of wine, for every three that it did yield.

"Twenty beds of the ſize of that we are ſpeaking of, would make about an arpent *; and ſuppoſing them all to produce alike, they would, after the rate of this, yield 6720 Paris pints (1680 Engliſh gallons), or 28 hogſheads; which, in this country (the territory of Geneva) is a prodigious quantity; ſuch as no vineyard here has ever yet produced †.

"The vintage of 1756 was neither plentiful nor good. I therefore did not make any compariſon; but remained ſatisfied with obſerving in general, that my bed yielded at leaſt as much as the old vineyard."

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* The arpent is to our acre, nearly as 51 are to 43.

† Varro ſays, that every *jugerum* of vines in Italy, yielded ſix hundred urns of wine: according to which proportion Dr. Arbuthnot calculates, that our acre ſhould yield fifty-five hogſheads, and a little more. This, as well as the anecdote before-mentioned, of P. Veterenſis's portioning out his two daughters, ſhews to what vaſt perfection the Romans had brought the culture of the vine; as, indeed, they did every other branch of agriculture.

SECT. VI.

## SECT. VI.

### OF THE CULTURE OF OLIVE TREES.

THERE cannot be the leaſt doubt but that Olives may be raiſed in ſeveral of the warm parts of the Britiſh Empire in America, ſuch, for inſtance, as South Carolina, Georgia, and Florida, as well, and probably as good, as any that grow in the South of France, Spain, or Italy; nor can it be queſtioned but that this product might then become a very conſiderable branch of trade to thoſe our valuable poſſeſſions. The premiums nobly offered by our truly public ſpirited Society for the Encouragement of Arts, Manufactures, and Commerce, both for promoting this important part of huſbandry, and for the cultivation of vines, will ſurely have the deſired laudable effect, of exciting a due attention to theſe beneficial articles of commerce *.

The

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* Among three hundred and ſeventy-five premiums, of gold medals, ſilver medals, or ſums of money, for objects tending to promote the general welfare of mankind; this moſt excellent Society, in the liſt thereof publiſhed April 13th, 1763, propoſes to beſtow the following; *viz.*

" *Prem.* 325. A premium of one hundred pounds will be given for the greateſt number, not leſs than five hundred plants, of Olive trees, of the ſame ſpecies as thoſe from which the beſt *Italian* oil is produced, properly planted, and effectually fenced, ſecured and cultivated within any of the *Britiſh* colonies upon the continent of *North America*, to the *Southward* of the river *Delawar*, conſidered as one diſtrict, between the twenty fifth of April 1763, and the 26th of April 1765.

" 326. And fifty pounds for the next greateſt quantity, not leſs than two hundred plants.

" 327. A premium of three hundred pounds will be given to that Perſon who ſhall, on the firſt of September 1767, have

or

The Olive tree will grow in almoſt any ſoil, provided the ſituation be very warm, with a full expoſure

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or be poſſeſſed of a vineyard or plantation in any of the colonies upon the continent of *North America, Southward* of the river *Delawar*, conſiſting of the greateſt number of vines, (not leſs than fifty), actually producing the true *Malaga* grape, from which the beſt raiſins are made.

" 328. And one hundred pounds for a like plantation or vineyard, conſiſting of not leſs than twenty-five plants, producing the ſaid grapes.

" 329, 330. The ſame premiums for Vines for Raiſins will be continued to the year 1770, with the following additional clauſe, *viz.*

" It will be expected that the claimants for the above premiums, ſhould at the time of making the claim, produce a quantity, (not leſs than ſix pounds) of Raiſins, certified to have been actually produced from Vines for which the premium is claimed.

" 331. A premium of two hundred pounds will be given for the greateſt number (not leſs than five hundred) of the plants of the Vines which produce thoſe ſorts of Wines now conſumed in *Great Britain*, which ſhall have been properly planted, and effectually fenced, ſecured and cultivated within any of the *Britiſh* colonies upon the continent of *North America*, to the *Northward* of the river *Delawar*, conſidered as one diſtrict, between the firſt of April 1762, and the firſt of April 1767.

" 332. And fifty pounds for the next greateſt quantity, not leſs than an hundred plants.

" 333, 334. The like premiums will be given, upon the ſame conditions, for the greateſt number of Vines in like manner planted and cultivated as above, within the ſame time, in any of the *Britiſh* colonies on the continent of *North America*, to the *Southward* of the river *Delawar*, conſidered as one diſtrict.

" 335, 336. And the ſame premiums for the greateſt quantity in like manner planted and cultivated within the ſame time, in the *Bermuda* iſlands.

" *N. B.* The perſon who ſhall be intitled to the premium for making five Tons of Wine, as publiſhed in the liſt of premiums in 1761, ſhall not be intitled to theſe premiums.

(⁂ The article here referred to runs thus. " As the producing of Wines in our *American* colonies will be of great ſervice to thoſe colonies, and alſo to this kingdom, it is propoſed to give the Planter, in any of our ſaid colonies, who ſhall firſt produce (within ſeven years from the fifth day of April 1758) from expoſure to the South or Eaſt, eſpecially on the ſide of a hill, or other riſing ground; for it never bears well in a flat, or valley. It grows to the largeſt ſize when planted in rich moiſt ground: but it's fruit is beſt, either for eating, or for making oil, when produced on a poorer ſoil. That which grows on chalky land mixed with coarſe ſand, and lying upon a bed of gravel, is thought to yield the fineſt and beſt keeping oil: but a watery, oozy, or quite chalky ſoil, is not fit for the olive.

This tree ſeldom riſes higher than from twenty to thirty feet; nor is it often ſeen with a ſingle ſtem, but generally with two or three, which riſe from the ſame root, and put out from their ſides, for almoſt their whole length, branches which are covered with grey bark, and garniſhed with ſtiff leaves about two inches and an half long, and an inch broad in the middle, gradually diminiſhing to

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from his own plantation, five Tons of white or red wine, made of grapes, the produce of the colonies only, and ſuch as in the opinion of competent judges appointed by the Society in *London* ſhall be deemed deſerving the reward, not leſs than one Ton thereof to be imported at *London*; one hundred pounds.

"A certificate under the hands of two or more Juſtices of the Peace reſiding in the county, or of the Miniſter and Church-wardens of the pariſh where ſuch Wine was made, ſetting forth that the Wine was grown and made at the place mentioned therein, and that the remainder of the wine is equally good with that imported, and ſuch certificate backed or counter ſigned by the governor or chief magiſtrate of the colony, will be expected by the Society at the time the premium is claimed.

"337, 338. The like premiums will be given, upon the ſame conditions, for the greateſt number of vines, which produce thoſe ſorts of Wines now conſumed in *Great Britain*, which ſhall have been properly planted, and effectually fenced, ſecured and cultivated within any of the *Britiſh* colonies upon the continent of *North America*, to the *Southward* of the river *Delawar*, or in the *Bermuda* iſlands, each to be conſidered as one diſtrict, between the firſt of April 1767, and the firſt of April 1768."

both ends. They ſtand in oppoſite pairs, and are of a lively green on their upper ſide, and hoary on the under. The flowers, which are produced in ſmall bunches from the wings of the leaves, are ſmall, white, and have ſhort tubes, ſpreading open at the top; and theſe are ſucceeded by oval fruit, which ripens in the autumn.

The ſorts of olives which are chiefly cultivated in Provence and Languedoc are diſtinguiſhed by the appellations of, the *cormeau*, the *ampoulan*, and the *moureau:* but theſe are only variations of the *Olea foliis lineari-lanceolatis ſubtus incanis*, or Olive with linear ſpear-ſhaped leaves, hoary on their under ſide; which is Tournefort's *Olea fructu longo minori* *, or Olive with a ſmaller oblong fruit. The Spaniſh olive is M. de Tournefort's *Olea fructu maximo* †, or Olive with the largeſt fruit. The Lucca, and other Italian olives, produce the ſmalleſt fruit of all; and theſe, which have likewiſe narrower leaves than either of the former ſorts, are alſo the moſt hardy. The African olive, of which Dr. Boerhaave ‡ diſtinguiſhes two ſorts, *viz.* the *Olea Afra, folio longo, lato, ſupra atroviridi ſplendente, infra palidè viridi*, or African olive with a long, broad, ſhining leaf, of a blackiſh green above, and pale on it's under ſide; and the *Olea Afra, folio buxi craſſo atroviridi, lucido, cortice albo ſcabro*, or African olive, with a thick dark coloured ſhining box leaf, and a rough white bark, commonly called box-leafed Olive, muſt certainly require a very great degree of heat; for I do not find that it has been ripened in any country but that of it's native growth, and at the Cape of Good Hope: neither do I meet with any account of it's qualities, either for eating, or for making of oil.

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* *Inſt. R. H.* 599.

† *Ibid.*

‡ *Ind. alt.* 2. 218.

It would be at leaſt very tedious to raiſe Olive trees from the ſtones of their fruit: but they may be eaſily enough propagated by layers, cuttings, or off-ſets from their roots.

The layers, which are formed by laying down the tender branches, in the ſame manner as is practiſed for other trees, muſt be allowed two years to take root, before they are cut off from the mother tree, in order to their being planted in the nurſery; for a nurſery is as neceſſary for the raiſing of theſe as it is for any other ſort of fruit trees. This nurſery ſhould be in a free air, in land that is moderately ſtrong, but rather light than heavy, and ſomewhat moiſt, though by no means wet or watery. It ſhould be ploughed well, and repeatedly, or rather thoroughly dug, to the depth of at leaſt three feet, ſo long before the time of planting, as that it may be well mellowed by the influences of the air, &c.

The cuttings, or rather truncheons, for they ſhould be full two inches in diameter, and not above a foot and an half long, ſhould be taken from the ſtraiteſt, roundeſt, and moſt fruitful branches of young trees, the bark of which is ſmooth and perfectly ſound. They ſhould he ſawed off with care not to hurt the bark or any other part of them, and with eyes towards each end, to produce ſhoots at the one, and roots at the other. Both the cut extremities ſhould then be ſmoothed with a ſharp knife; and after that the wounds have been covered with the grafting clay or cement before mentioned [d], or, ſays Columella [e], with dung mixed with aſhes, theſe truncheons ſhould be ſet in the nurſery, ſo deep as that the upper end may be covered with four fingers depth of earth. Care muſt here be taken to place that end uppermoſt, which was uppermoſt on the tree; and in order to be ſure of this, they ſhould be marked with chalk, or ſome other ſoft ſubſtance, as ſoon as they are cut: for if they were put under ground inverted, it would be long before they would ſtrike out roots, and even though they ſhould afterwards produce ſtrong trees, they would be for ever barren. A mark ſhould alſo be ſtuck up on each ſide of the cutting thus planted, in order that the digger of the nurſery may not injure it with his ſpade or hoe. The beſt way therefore is to ſet them in ſtrait rows, and at regular diſtances from each other.

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[d] *Page* 213.

[e] *De re ruſtica, Lib.* V. *c.* 2.

When the off-ſets from the roots, which are generally moſt numerous when the head of the tree has been hurt by froſts in the winter, are grown pretty ſtrong, they are ſeparated from the tree with a ſharp ax, ſo as to preſerve a few roots to them, and they are planted about two feet deep in the ground. This is the moſt uſual method of propagating the olive tree in Languedoc and Provence.

November is the moſt proper ſeaſon for either of the above ways of planting in very warm countries; but February and March are preferable for milder climates.

The holes for planting theſe layers, cuttings, or off-ſets, but eſpecially for the cuttings, or truncheons, ſhould be four feet large every way, and ſhould remain open for at leaſt two months before the plants are ſet in them, in order that the earth may be the better mellowed. The mould which is to be returned into them ſhould alſo be mixed with well rotted dung and wood aſhes; and when the plants are ſet, it ſhould be trodden down gently about them.

The young trees muſt remain in this nurſery five years, during the firſt of which the ground ſhould be well hoed with a hand-hoe, and in the courſe of the others it ſhould be dug with a ſpade, or carefully horſe-hoed, at leaſt every ſpring and autumn, and it ſhould be kept conſtantly clear from weeds. The ſoil ſhould alſo be well manured every autumn with thoroughly rotted dung, and the plants ſhould be watered now and then in very dry ſeaſons. They ſhould not be pruned at all during the two firſt years: in the third, two branches only ſhould be left upon each of them; and in the fourth, the weakeſt of thoſe two branches ſhould be cut off. When the trees thus reared are five years old, they will be fit to tranſplant into the places where they are to remain. This is beſt done in November, if the ground intended for their future growth is dry, and the climate hot: but the ſpring, a little before their time of budding, is beſt for ſuch lands as are rich and moiſt. The trenches, or holes, for this new planting ſhould be laid open for a year before they are uſed; or if ſo much time cannot be allowed, let ſtraw be burnt in them, that the heat of the fire may bring the mould to that looſe and crumbling ſtate, which it would otherwiſe have derived ſtill more effectually, from the ſun, air, and froſts. Care ſhould alſo be taken, that there be no wet at the bottom of them when they are planted; and the earth with which they are filled up after the trees are ſet (being that which was before dug out of them and ſpread abroad to mellow) ſhould be mixed with well rotted dung, and trod down gently about the ſtems, as above directed for the nurſery. The rows of theſe trees ſhould be from about thirty to thirty five feet aſunder in land which is rich enough to bear corn; but about twenty or twenty five feet will be enough for ground of an inferior quality, where their growth will, of courſe, be leſs luxuriant. The diſtances between the trees in the rows ſhould be in proportion; and, both here and in the nurſery, they ſhould be carefully fenced from cattle, eſpecially whilſt they are young. The trees ſhould be taken up with as much earth as can be about their roots: the rows ſhould be directed towards the weſt, that the ſummer breezes may have the freer paſſage through them; and Columella [f] is again of opinion here, that the trees thus tranſplanted ſhould be ſet to the ſame aſpect as they had in the nurſery.

The olive grounds in the South of France are carefully dug, or ſtirred pretty deep with a hoe, twice a year, *viz.* at Midſummer and at Michaelmas. Channels are likewiſe cut, to convey the rain, and the fine mould which is waſhed down with it, from the higher parts of the ground to the ſtems of the trees on the lower; and in the autumn, about ſix pounds of goat's dung are laid around the foot of each olive tree, with ſometimes a ſmall quantity of the lees of oil of olives, to fatten the land, and kill the worms which breed in it. The roots of the olive tree are laid bare every year from October till February; all young ſhoots which have ſprung out of the lower part of the ſtock are extirpated every year, unleſs it be an old tree which is to be renewed thereby, in which caſe one or two of the fineſt ſhoots are left; and all the dead wood is pared off very cloſe.

The olive tree is not pruned till it is eight years old, nor, after that, oftener than once in eight years. This is moſt uſually performed at the end of the winter, a little before the buds begin to ſwell; but I have already given my reaſons for not thinking this the moſt proper ſeaſon. However, it ſhould be done in fine weather; and the people of

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[f] *Ibid.*

Provence and Languedoc, who may poſſibly have experience on their ſide, and therefore I ſhall not pretend to contradict them, hold, that the moon ſhould always be in the decreaſe when theſe trees are pruned. They heal the wounds made in pruning, by rubbing them with lees of oil drawn without ſalt, or covering them over with the ſubſtance which remains of the olives after their oil has been preſſed out.

Skilful husbandmen manure their olive grounds every third year, generally with well rotted dung, whether they be, or be not, ſown with corn in the intervals between the trees; which laſt practice Columella recommends, becauſe, as the olive tree does not produce an equal plenty of fruit in any two ſucceſſive years, the other crop will help to make amends for the deficiency, and the ſtirring of the ground, by plowing it, will always be of ſervice to the trees. *He*, ſays that excellent judge of rural affairs, alluding to a proverbial expreſſion which was old even in his days, *who plows his olive ground, aſks fruit*; *he that dungs it, begs and intreats it*; *but he who prunes his olive trees, commands it*[g]. But at the ſame time he cautions us not to repeat this laſt part oftener than every eighth year, leſt thoſe which would be fruit-bearing branches ſhould be injured, or cut off.

An olive tree which thrives well, and does not produce fruit, may be made to bear by cutting off one of its principal roots; or by laying to its roots lees of unſalted oil, mixed with ſtale urine of men or ſwine[h]: but the ſureſt way is to engraft it with a good cion of its own kind, taken from a fruitful branch of a well bearing tree. This is generally done in May, and the method is that of ſcutcheon-grafting: but no part of the ſtock is cut off till a year after. Then, indeed, its head is cut off cloſe to the graft.

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[g] *Ibid.*

[h] COLUMELLA, *ubi ſupra.* And *Maiſon ruſtique*, *Tom.* I. *Part.* 2. *Liv.* 4. *c.* 2.

In Provence, when an olive tree is decayed, and therefore condemned to be grubbed up, the following method is uſed in order to force it to yield a good final crop. The breadth of an inch of bark is peeled off all around its youngeſt branches, and the place thus bared is covered with an equal ſlip of other bark taken from the branch of a young tree of the ſame ſpecies. The wound is then dreſſed in the ſame manner as is practiſed for grafting, and the branches of the old tree thus ſpliced in the rind yield an uncommon quantity of fruit. Nearly the ſame thing is done in Languedoc, by grafting old olive trees in the month of May, and then cutting the bark off circularly to the breadth of about three fingers, juſt above the graft, ſo as to lay bare the wood of the ſtem or branch which has been engrafted; the conſequence of which is found to be, that the tree produces a double quantity of bloſſoms and of fruit. The trees thus forced die indeed the ſame year: but as this operation is not performed till they are no longer worth cultivating, it is thought beſt to kill them in this manner, becauſe an extraordinary crop of fruit is obtained thereby [i].

In Spain, the olive trees are not ſuffered to grow ſo high as they do in France: on the contrary, they are kept low, like ſhrubs, and are found then to yield the moſt fruit, which is alſo leaſt apt to be blown off or injured by high winds, and likewiſe the eaſieſt to be gathered. Theſe trees are therefore cut low when they are pruned: for their nature is to produce either a great deal of wood, or a great deal of fruit. The Spaniards give the preference to their large olives, becauſe they are moſt fleſhy, and yield the greateſt quantity of oil: but neither the fruit nor the oil of that country is at all comparable to the product of France or Italy.

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[i] *Maiſon ruſtique, Tom.* I. *Part.* 2. *Liv.* 4. *c.* 2.

The olive tree is long lived, and its wood, which has an agreeable ſmell, and is prettily veined, is eſteemed by the turners.

The antients looked upon the olive as a maritime tree, and ſuppoſed that it would not thrive far from the ſea: but, though it does bear the ſpray of the ſea better than moſt other ſorts of trees, experience has ſhewn that it will ſucceed perfectly well in any country where the air has a proper degree of heat.

The fruit of this tree is gathered by hand, either in June or July, while the olives are green, if they are intended for pickling; or in November and December, or even January, when they are thoroughly ripe, which is known by their beginning to turn to a blackiſh red, if they are deſigned for oil.

### *The method of pickling of Olives.*

The method of curing the *picholines*, as they are called, which are the ſmalleſt ſort of olives, but the beſt for eating, is thus [a]. After they have been gathered, they are ſpread abroad upon cloths, for ſome days, in the air, to dry; and then they are put up in barrels, and a leye made of a buſhel of the aſhes of burnt cuttings of vines, or of boughs of oak, and half a buſhel of well ſifted lime, with a proportionable quantity of water, is poured over them till they are covered. They are well ſtirred about in this leye, but with great care not to bruiſe the fruit; and after they have ſoaked thus for about twelve hours, an olive is taken out and ſplit, to ſee whether its fleſh ſeparates from the ſtone. If it does, 'tis time to pickle the fruit.

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[a] *Maiſon ruſtique, Tom.* I. *Part.* 2. *Liv.* 4. *c.* 2.

Some people put unſlaked lime into this leye, which, in that caſe, becomes of a red colour, and gives the olives a ſharp acrid taſte. To take off their bitterneſs entirely, for they are exceſſively bitter when freſh gathered from the tree, they are laid, after being taken out of the abovementioned leye, to ſoak in ſoft water, which is changed every day, till they become even flat and inſipid, as they generally do in eight or nine days. When brought to this ſtate, they are put, with their pickle, into other barrels, in which they become fit for eating in about a month. This pickle is made by diſſolving in water as much ſalt as will render it ſtrong enough to bear an egg, and then adding to it garden thyme, wild thyme, and a few branches of aniſe or fennel. The pickle muſt be changed every three months, or the olives will loſe their taſte.

Others keep their olives a long time before they pickle them, either in ſmall wine, or in ſalt and water, and many eat them when only ſo prepared. The ſmall wine is better than ſalt and water, becauſe the olives acquire a diſagreeable taſte in this laſt, and often grow rotten in it.

When they want to pickle, either the olives thus preſerved in weak wine, or in ſalt and water, or ſuch as are freſh gathered, and as yet quite green, they ſteep them for ſeveral days in freſh water, which they change very often, and then take them out, and put them in a leye made of water prepared with barilla, or kali, and with aſhes of oliveſtones calcined, or with lime. They are afterwards laid in a brine of water and ſalt, which is put in thoſe little barrels, wherein they are brought to us; and, to give them a flavour, an eſſence, uſually compoſed of cloves, cinnamon, coriander, and fennel, is thrown over them. It is in the compoſition of this eſſence that the whole ſecret of pickling olives conſiſts. When thus managed, they are fit for eating in ſeven or eight days.

In the Levant, they eat none but black and thoroughly ripe olives: after theſe have been dried a little in the ſun, they are put into jars, and preſſed cloſely down, with layers of ſalt between them; but no water.

The picholines keep longer than olives prepared in any other manner. The Spaniſh olives are larger and bitterer than thoſe of Verona. The Provence and Languedoc olives are of a middle ſize, between the picholines and the Verona olives.

### *The method of drawing, and of keeping, Oil of Olives.*

They who would have that exceedingly delicate and finely flavoured oil, which is called *virgin oil*, and of which the beſt comes from Graſſe, Oneille[b], Aramont, Aix, and Nice, (for theſe are greatly ſuperior to all the Italian oils,) grind their olives with a mill-ſtone as ſoon as they are gathered, the time for which is, as before obſerved, in November, December, or January, or, in other words, when their perfect maturity is denoted by their beginning to turn red. But as the newly gathered olives yield but little oil, thoſe who prefer quantity to quality, after cleaning them, and even waſhing in warm water ſuch as are foul or dirty, ſpread each day's gathering ſeparately on a dry ſpot of ground, and let them remain there ten or twelve days, to heat and ferment; by which means a great deal of watery moiſture is exhaled from them, and they are diſpoſed the more eaſily to part with their oil. After this, they are either ground in a mill, or ſqueezed in a preſs. The firſt oil which comes from them is the beſt. There are who beſtow upon this the appellation of *Virgin oil:* but, in fact, it is only a ſecond oil, neither the ſmell nor taſte of which bears any compariſon with the true virgin oil.

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[b] The valley of Oneille, or Oneglia, highly commended for its vines, as well as for its olives, borders upon the ſtate of Genoa, and is ſubject to the duke of Savoy.

The common oil, which is of a yet inferior quality, is drawn after this, by pouring hot water upon the marc, as it is called, or reſidue of the olives, and preſſing it more ſtrongly than before.

There are likewiſe ſome who, even after this, ſtir up the remaining marc, then pour upon it boiling water, and ſqueeze it as hard as poſſible in the preſs, to extract every drop of oil. But this third running is always very coarſe and full of dregs.

Theſe oils are eaſily ſeparated from the water, becauſe they ſwim a-top of it. The lees ſink to the bottom. They are drawn off into different veſſels, that they may not be mixed. Some think that wooden tubs are better for this uſe, than earthen pans. When the oil has ſettled a little in the firſt tub, it is poured off into others. The more it is ſtirred, the clearer and better taſted it will be. It keeps better in veſſels made of goat-ſkins, than in any other [b].

All the ſkins deſtined to receive the oil ſhould be not only well cleanſed and ſcalded, but alſo carefully done over with wax or gum, or covered with very pure and well diluted fine potters clay.

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[b] *Maiſon ruſtique, Tom.* I. *Part.* 2. *Liv.* 5. *c.* 4.

A thin coat of white wax will prevent the oil from turning black. When the oil is poured off, the ſkin which contained it ſhould be waſhed immediately with warm water, and wiped with a ſpunge; and laſtly, after ſcalding thoſe in which there remained any lees, theſe ſhould be laid to ſoak for ſome time in running water, and then be well beaten with ſticks, to force off every kind of filth.

Olives waſte greatly by keeping, and therefore ſhould be preſſed as ſoon as poſſible after they are quite ripe. Great care ſhould be taken not to ſuffer any ſmoke, lighted lamp, heat or ſmell which may tarniſh or corrupt the oil, ever to come, or be brought into the place where the oil is made.

Many people put two pounds of ſalt to each buſhel of olives when they preſs them; and they preſs them either in new frails or wicker baſkets, or upon hurdles of wicker; according as the one or the other chances to be the cuſtom of the country: it is immaterial which of theſe is uſed.

The olives which are intended for oil ſhould be left upon the tree till they are even rotten ripe, in which ſtate they have a ſweetiſh and oily taſte. Not a drop of oil can be extracted from olives which are not perfectly ripe; but only a viſcous juice called, in pharmacy, *omphacion.* This is what the ancients uſed in lieu of real oil. It keeps well in glaſs or ſtone bottles.

New made oil generally requires thirty days for the perfect ſettling of its lees, and for this reaſon it is not drawn off till then for the laſt time. It ſhould be kept in a cool, dry, and very clean place; becauſe heat, moiſture, and dirtineſs, are great enemies to oil.

It is pretended in warm countries, that oil never freezes, and that it is only the lees mixed with it which freeze and thereby entangle the finer parts of the oil, unleſs ſalt baked a ſecond time and well pounded, be mixed therewith; for oil never takes any taſte of ſalt, though ever ſo great a quantity thereof be put to it. It is likewiſe ſaid, that it will remain always clear, if a little bag full of the leaves and bark of an olive tree pounded and mixed with ſalt be put into the barrel; and alſo that its growing rank may be prevented, or its rankneſs, if it has already contracted that defect, be cured, by throwing in an equal quantity of aniſe, or of melted wax, of ſalt and of oil, mixed together. It is eaſily clarified when turbid, by pouring upon it hot water.

## SECT. VII.

### OF THE CULTURE AND MANAGEMENT OF HOPS.

THE beſt method yet laid down for the culture of Hops is delivered to the following effect, in a pamphlet drawn up, and publiſhed in the year 1733, by order of the reſpectable Dublin Society for the advancement of Agriculture and Manufactures.

A rich, deep, mellow, dry ſoil, more inclining to ſand than clay, is, in general, the fitteſt for Hops; and, in particular, a black garden mould is excellent. Stiff clays, ſpewy lands, ſuch as are apt to be overflown by floods, hard gravels, ſtony grounds, very ſandy ones, and ſuch as are not at leaſt a foot and an half deep, are altogether improper for hops.

The beſt ſituation for hop-grounds, is ſuch as inclines to the South, or lies open to it, ſo that they may have the benefit of the ſun during the greateſt part of the day. It muſt alſo be open for the air to have a free paſſage and circulation between the plants; and it ſhould be ſo ſheltered to the Eaſt, North, and Weſt, that neither the froſty winds in the ſpring may cut off the young ſprouts, nor the more ſtormy ones in ſummer and autumn deſtroy the full grown hops.

The ground and ſituation being choſen, the next buſineſs is to prepare it for the planting. In many parts of England, when the ground is broken up for this purpoſe, the plough goes firſt, and men follow it with their ſpades, with which they dig one ſpit deep in the furrow where the plough has paſſed, throw up the earth thus dug, and ſo continue to plough and dig till the whole is done. Either this tillage, if it be well performed, or the deep plowings, croſs-plowings, and harrowings, by which careful husbandmen prepare their land for corn, will fit this for being ſown with turnip ſeeds in the end of July, or beginning of Auguſt, and if the turnips are hoed twice, ſo as to be left about eight inches aſunder, they will yield a good crop, the weeds will be deſtroyed, and the ground will be rendered looſe and fine. Another good plowing after the turnips are taken off, will, with the enſuing winter mellowing, render it fit for being planted with hops in the ſpring. The beſt time to begin the plowing is in October, in order that the ſoil may be properly prepared to receive the benefits of the winter's froſts, rains, and ſnows; after which, in the beginning of ſpring, it ſhould be well and deeply plowed again, and well harrowed; and after another plowing in March, which will be of very great ſervice, it ſhould be harrowed fine, and laid as even as can be.

If the mould of the hop-ground be naturally good, and made fine by the abovementioned preparation, there will be little or no occaſion to manure it the firſt year: but if the ſoil is not rich or fine enough, it will be right to bring into the hop-ground, in the ſpring, ſome freſh mould, or mould mixed with old rotten dung, or other manure ſuited to the nature of the land, in ſuch quantity that there may be about half a buſhel of it for each hop-hill.

When the ground is in proper readineſs for planting, ſtretch along a ſtrait ſide of the field, at fifteen or twenty feet diſtance from the hedge, and parallel to it, a line with knots or rags tied in it, as far aſunder as you deſign your hills to be, and ſtick in the ground a ſharp pointed ſtick at every knot, as marks for the places where the hills are to be made: continue the line in this manner the whole length of the ground, and from this firſt row you may mark out the reſt of the field, either in ſquares, chequer-wiſe, at the intended diſtance of the hills, or in the quincunx form, where the hills of every row lie oppoſite to the middle of the firſt, in a triangular form.

The diſtance of the hills ſhould be, in ſome meaſure, regulated by the nature and goodneſs of the ſoil: but, in every caſe, they ſhould be far enough aſunder to admit the hoe-plough at all times without danger to the plants: for the cultivating of hops according to the principles of the new husbandry, which have been amply explained in former parts of this work, will moſt certainly ſave a very great part of the heavy expence which neceſſarily attends the managing of hop-grounds in the common way, and at the ſame time produce the beſt and fineſt crops. If the ſoil be dry and ſhallow, ſix or ſeven feet will be a convenient diſtance: but if it be rich, moiſt, and apt to bear large hops and leaves, it may be right to allow eight or nine feet between the hills. If the hills ſhould be found to be too far aſunder, after the ground has been planted ſome time, and is thereby become what is commonly called an old hop-ground, that inconvenience may in ſome meaſure be remedied by enlarging the hills and increaſing the number of roots and poles: and if the hills are too near, it will be neceſſary to leſſen the quantity both of plants and of poles: for the over-poling of a hop-ground, either in number or height of the poles, is of much worſe conſequence than poling it too little.

The moſt proper ſeaſon for planting hops is from the beginning of March to near the middle of April, at the time when they begin to ſhoot. The Kentiſh husbandmen approve likewiſe of October: but the common ſorts are not to be procured then, unleſs it be from a ground that is to be dug up and deſtroyed; beſides which, there is ſome danger of their rotting in the earth, if the winter ſhould prove very wet.

There are ſeveral ſorts (though the botaniſts allow but one ſpecies) of hops. The moſt eſteemed are, the long white, the oval, and the long ſquare garlic hop. Theſe differ from each other in the colour and ſhape of their bells, or hops, in their degree of bearing, and in their time of ripening. The long white is moſt valued, becauſe it is a great bearer, and produces the moſt beautiful hops; for the beauty of hops conſiſts in their being of a pale bright green colour. The oval hop is beautiful, but does not yield ſo large a crop. There is a ſort of this kind of white hop, called the early, or rath hop, which ripens a week or ten days before the common, and is therefore of advantage to thoſe who would be firſt at market:

but it is tenderer than the other, and does not bear near ſo plentifully. The long ſquare garlic hop is the greateſt bearer, more hardy, and ſomewhat later ripe than the former; but, by reaſon of its redneſs towards the ſtalk, it is not ſo beautiful to the eye, and therefore is not ſo much eſteemed, as the other ſorts.

Few hop-grounds are without ſome plants of a ſort of hop which many call the female hop, but very erroneouſly, for the female hop is that which is cultivated for uſe, and this, which others name more properly the wild hop, is the male[c]. Towards the middle of July, it puts out a great number of long looſe bunches of ſmall flowers, not at all like the true hop; and in ſomewhat leſs than a month after, that is to ſay, juſt before the true hop begins to bloſſom, they ripen, and, with the leaſt motion of the wind, ſhed a farina, which is wafted all around, and is by ſome, not improbably, thought to be of uſe to impregnate other hops. Thoſe who are of this opinion adviſe therefore to leave one or two hills of them ſtanding in the hop-ground. But the common practice is to mark them at their firſt appearance, and to root them out afterwards, becauſe they do not bear bells or hops, and as they are generally the ſtrongeſt plants, ſets might otherwiſe be taken from them, by miſtake.

There is alſo a poor ſtarved hop, called a wild hop, which is not judged to be a diſtinct ſort, but a hop which has degenerated for want of culture.

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[c] This is the ſort of hop which grows wild by the ſide of hedges, and upon banks, in many parts of England, and of which the young ſhoots are often gathered by poor people, and boiled as an eſculent herb: but they muſt be taken very young, for otherwiſe they will be tough and ſtringy.

The ſeveral kinds and goodneſs of hops may likewiſe be known by the colour of the vines, binds, or ſtalks. The whitiſh binds produce the white hop, both the long and the oval: the grey or greeniſh binds commonly yield the large ſquare hop: and the red binds bear the brown hop, which is the leaſt eſteemed.

The planter of hops ought to be extremely careful in the choice of his plants, or ſets, particularly in regard to the kind of the hop: for it is a great trouble and loſs to him when his garden proves to be a mixture of ſeveral ſorts of hops, ripening at different times. He who plants the three ſorts of hops before mentioned, *viz.* the early, the long white, and the ſquare hop, in three diſtinct parts of his ground, will have the conveniency of picking them ſucceſſively as they become ripe.

Hop-ſets are cuttings from the roots or branches which grow from the main root or ſtock. They ſhould be procured, if poſſible, from grounds planted with none but the ſort which is deſired; and they ſhould be from five to ſeven or eight inches long, with three or more joints or buds on them, all the old bind and hollow part of the ſet being cut off.

If it be deſired to increaſe any particular ſort of hop, by taking plants or ſets from it, the ſuperfluous binds may be laid down when the hops are tied, cutting off their tops and burying the lower end in the hill: or when the hops are dreſſed, all the cuttings may be ſaved, and laid in rows in a bed of good earth; for almoſt every part of them will grow, and become a good ſet the next ſpring.

Some have tried to raiſe hops by ſowing the hop-ſeed; but that turns to no account, not only becauſe the method is very tedious, but alſo becauſe the hops ſo produced are of different kinds, and many of them wild and barren.

The largeſt ſets ſhould be preferred: the beſt are to be had out of gardens which have been well kept: they ſhould be of the growth of the preceeding year, which is eaſily known by their colour, always white when they are of that age.

The ground being prepared for planting, as before directed, towards the latter end of February, or in the beginning of March, if the ſoil be light, or late in March if it be ſtrong and moiſt, make, in the places marked out by the ſticks ſtuck in them, holes about twelve or ſixteen inches wide, and of a depth proportioned to the nature of the ground. In general, ten or twelve inches will be a ſufficient depth. If the ground be ſhallow, and you meet with hard clay or gravel, by no means enter into this, for you would then make a baſon to retain water; but, in ſuch caſe, inſtead of going deeper, raiſe up a ſmall hill of good mould. If there is a good depth of rich mellow mould, dig the hole a foot and an half or two feet deep, and you will find the hops thrive the better; for their tap roots naturally run downward.

If ſets can be had from a hop-ground at a ſmall diſtance, bring no more of them at a time than you have holes ready made for them, and plant them as ſoon as poſſible; taking care, by keeping the roots in wet litter, to prevent their growing dry: but if the ſets are procured from a great diſtance, lay them up in dry ſand or earth, as ſoon as they are cut, or pack them in ſuch manner that no air may get to them before they are planted; and when you have brought them home, bury them in ground, and plant them as ſoon as the weather will permit.

When all things are ready for planting, fill up the holes with the mould before thrown out of them, if it be naturally good, after having firſt broke it fine with a ſpade: but if the ſame earth be not rich enough, make uſe of fine freſh mould, or of the compoſt provided for this purpoſe. About a peck or two of this will be ſufficient for each hill, as was obſerved before; but no new dung ſhould be put into the hole on any account.

Then, with a dibble or ſetting ſtick, ſuch as gardeners generally uſe for planting of beans, make five or ſix holes, the depth of your ſets, one in the middle, perpendicular, and the reſt round about, ſloping, and meeting at the top, near the centre: put your ſets therein, ſo that they may ſtand even with the ſurface of the ground; and then preſs the mould cloſe to them, and cover them with fine mould two or three inches thick. A ſtick ſhould be placed on each ſide of the hill, to ſecure it.

Some place all the ſets in the middle of the hole before they fill it, ſpreading the lower parts of them towards the ſides, and laying the tops even with the ſurface; then holding them tight with one hand, they throw the mould in with the other, and preſs it round about them. Either of theſe ways may do: but the firſt is moſt convenient, and moſt in uſe.

Care muſt be taken to plant that end of the ſet uppermoſt which grew ſo before, and not to leave any part of the dead ſtalk on the upper joint. The right end of the ſet may be diſcerned at once, by noticing the direction of its buds or eyes.

If the ſets have begun to ſhoot before you had time to plant them, the young buds ſhould not by any means be covered with mould, for that would deſtroy them.

The ground being thus planted, all that is to be done in the following ſummer, is to keep the hills and alleys clear from weeds by frequent hoeings; to dig the ground in the month of May, and to carry off all the ſtones, that are turned up by digging; to raiſe a ſmall hill about the plants, to throw ſome fine mould on their roots, and in the latter end of May or beginning of June, to twiſt all the vines and branches together into a bunch or looſe knot, and lay them thus twiſted on the top of the hill. Some chooſe to put to each hill one or two ſticks, of three or four feet long, for the vines to twiſt about, as more agreeable to the hop, eſpecially if the vines be vigorous: but care muſt be taken to prevent the hop from bearing the firſt year; for that would weaken the plant.

At or about the next Michaelmas, if the weather be dry and the ground hard enough to bear the wheels of a dung cart, for otherwiſe you muſt wait till the froſt has hardened it, lay on the alleys between the hills, of rotten dung, or dung mixed with earth, or other manure, which every hop-planter is ſuppoſed to provide for his winter dreſſing, about forty loads (the load about thirty buſhels) to an acre; more or leſs according to the goodneſs of the land; and in November or December following dig or plow it in, that it may the better incorporate with the ſoil. Some, eſpecially when they cannot manure their hop-grounds till the ſpring (but the doing of it in autumn is infinitely preferable), give their young hops a ſmall dreſſing in October next after they are planted; and in ſo doing, they open the hill carefully, in dry weather, and cut the binds a little below the ſurface of the earth, then cover the tops of the plants with fine mould two or three inches thick, and lay thereon a thin coat of earth from the alleys. This defends them from the froſts in winter, and is of uſe at the next dreſſing in the ſpring: but in the mean while the hop-ground ſhould always be dug or plowed ſome time in the winter: nor ſhould this dreſſing in October be practiſed in any but the firſt year after planting.

Towards the latter end of February, or in the beginning of March, in the ſecond year, when the weather is kindly, open the hills, and, with a ſharp knife, cut off the ſhoots of the firſt year to within an inch of the old ſtock, together with all the young ſuckers that have ſprung from the ſets, and cover the ſtock with fine earth. To keep the knife ſharp, you ſhould have a whetſtone always by you at dreſſing.

In the third and following years, when you dig your hop-ground in February, let the earth be taken away with a ſpade, or hoe, round about the hill, very near them, that you may the more conveniently come at the ſtock, to cut it. Then, in fair weather, towards the beginning of March, if your hops be weak, begin to dreſs them; but if they are ſtrong and in heart, the middle or latter end of March will be the beſt time; for late dreſſing reſtrains their too early ſpringing, which is the cauſe of many injuries to the hop.

The manner of performing the dreſſing is thus. Having, with an iron picker, cleared away all the earth out of the hills, ſo as to lay the ſtock bare to the principal roots, with a ſharp knife cut away all the ſhoots which grew up with bines the laſt year, and alſo all the young ſuckers, ſo that none be left to run in the alleys, and weaken the hill: cut them as cloſe as you can to the old root, if the plant be ſtrong; to a weak hop, ſome part of the new ſhoot may be left at dreſſing. The tap roots, which run downward, ſhould not be cut by any means, but only the ſide roots, which would otherwiſe incumber the ground. Great care muſt be taken not to hurt the old roots; but all the new ones ſhould be cut away, and ſuch of them as you intend to make new ſets of, to plant out, ſhould be laid by. The old roots are red, and the young white; ſo that they are eaſily diſtinguiſhed. If there happen to be wild hops in any of the hills, they muſt be taken up and deſtroyed. Some are of opinion, that even the whole hill muſt be grubbed up in this caſe, and that the ſpot muſt be new planted.

When the hop has been long planted, it is adviſed to cut one part of the ſtock lower than the other, and the followiug year to cut that part low, which was before left the higheſt. This will make the plants ſhoot with the greater vigour.

When you have thus pruned the roots, apply ſome rich mould or manure to them, but make not the hills too high at firſt, leſt you hinder the growth of the young ſhoots. Though the hops are ſpringing out of the hill before you begin to dreſs them, you need not fear to cut off their roots.

No poultry, and eſpecially geeſe, ſhould be ſuffered to run in a hop-garden in the ſpring, becauſe they are apt to devour the young ſprouts of the hops.

If the hops are grown old, or worn out of heart, as the term is, they will be recovered, and at the ſame time the weeds will be deſtroyed, by digging round them in the beginning of winter, or at fartheſt in January or February, and laying rich freſh mould to their roots, in lieu of the former exhauſted earth, which is then to be taken away, as deep as can be done with ſafety to the plants.

After the hops are dreſſed in the ſecond year, the next buſineſs is to pole them. Poles of only ten or twelve feet long will do then: but in the third year, by which time they come to their full bearing ſtate, they will require poles of full ſize. This, if the ground be rich, and the hop vigorous, will be from ſixteen to twenty feet or even more;

or there will be danger of loſing great part of the crop.

If the hop be weak, and the ground not rich, the poles ſhould not be more than from fourteen to eighteen feet long, for fear of impoveriſhing the root; for the hop will ſoon run itſelf out of heart if over poled; ſo that, as was ſaid before, there is more danger in over-poling, than in under-poling: neither can a good crop be expected from an over-poled ground, becauſe the branches which bear the hops grow very little till the buds have over-reached the poles, which they cannot do when the pole is too long *. Two ſmall poles are ſufficient for a hill in a young ground.

Three poles to a hill is the number generally uſed. If the hills are large, and diſtant from one another, ſome put four poles to them: but if they are ſmall and near, two poles may do. In dry hungry ground the poles may ſtand nearer together than in a rich mellow ſoil, becauſe this laſt will produce the largeſt and moſt haulmy plants.

Before you begin to pole, diſperſe your poles among the hills, three to a hill; obſerving to put the largeſt poles to thoſe hills where the hops appear to be moſt vigorous: but do not begin to pole till the young ſhoots are ten or twelve inches above

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* The author of one of the papers in the *Journal Oeconomique* differs pretty widely from the common practice both in this county and in Ireland, with regard to the proper height of the hop-poles, when he is made to ſay, in the *Select Eſſays on Commerce, Agriculture, Mines, Fiſheries, and other uſeful ſubjects*, tranſlated from that work;

"To uſe too long poles for hops is an error which ought to be corrected; for though the ſprigs are longer, and the leaves in greater abundance, it is manifeſt, on the other hand, that leſs fruit is gathered from them. In the very beſt ſoils, therefore, the poles ought not to exceed twelve feet in height, and in worſe ſoils, ten feet are ſufficient. If the ſprig mounts higher, it muſt be beaten down with a rod, that it may not grow higher, and that the plant may yield the more fruit."

above ground, which will be about the middle of April, or fourteen days after dreſſing, in rich land. You will then diſcern where the biggeſt poles are required, and may continue poling till the hops are two feet or more in height: but ſtay not too long, leſt you prejudice the hop, which will not grow well unleſs it has a pole or ſomething elſe to climb upon; and if the binds are ſuffered to grow ſo long as to fall into the alleys, they will be apt to entangle with one another, and not ſo readily take to the pole afterwards.

The better to fix the poles in the hills, make holes in the ground with a ſquare iron crow, ending in a ſharp point with three or four ſides of the ſame ſhape as the but-ends of the poles are to be; or with a long wooden dibble faced in like manner at the point with iron. This inſtrument ſhould be about three feet long, and not altogether ſo thick as the poles, in order that theſe may take the better hold. Its top ſhould be, like that of a ſpade, furniſhed either with an eye-handle, or a crutch, that the workmen may the better force it into the ground.

The depth to which the poles ſhould be fixed in the earth varies, according to the height of the pole, the ſtiffneſs of the ground, and the expoſure of the plantation to winds. High poles, a looſe ſoil, and a great expoſure, require their being put at the greateſt depth: but this general rule ſhould be obſerved every where, *viz.* that the pole be faſtened ſo deep, and ſo well, that it ſhall rather break than riſe. The uſual depth is about a foot and an half.

Make the holes at about a foot from the centre of the hill, or three inches from the main root, taking great care not to hurt the root of the hop, or any of its young ſhoots. Make three holes in each hill, one to the Eaſt, another to the North, and a third to the Weſt-ſide of it, that all the hops may the better receive the South-ſun. When the holes are made, force the poles into them, driving them down with a quick motion, and place them as perpendicular as you can, or rather leaning a little outward from each other, with all their bending tops turned outward from the hill, to prevent the entangling of the vines. A leaning pole commonly bears moſt hops; but it is more apt to be blown down, than an upright one.

When the poles are erected, ram the earth down on each ſide of them with a rammer, for their greater ſecurity againſt the wind; but do not by any means uſe the rammer within-ſide of the poles, for fear of bruiſing the ſhoots of the hops. This rammer may be made of a piece of wood about four feet long, and three inches thick at the bottom.

Have always ſome ſpare poles in reſerve to ſupport the vines, in caſe any of them ſhould break or be over-burthened; for if the hops are ſuffered to lie on the ground, they ſoon periſh.

If, after ſome time of growing, you find a hop under-poled, you may place a taller pole near it, and bring the hop from one pole to the other.

It is adviſable to place the ſtrongeſt and largeſt poles you have, in the third or fourth outermoſt rows of the plantation, eſpecially on the Weſt and South-weſt ſides; for they will ſtand beſt againſt ſtormy winds, and protect the inſide of the hop-ground from their violence.

In dreſſing and forming the poles, cut about a foot or more of the but-end with tree ſides ſloping to a point; for this triangular cutting is beſt to prevent their ſhaking in the ground. Poles of alder, birch, poplar, abele, or ſally, are eaſieſt and ſooneſt raiſed, and do well in low hop-grounds; but they are brittle, apt to break, rot ſoon, and do not, at moſt, laſt above four years.

The bark of alder and birch is thought to help the climbing of the hop: but, being apt to crack, it ſoon receives and imbibes the wet, which rots the pole: for which reaſon ſome who uſe them are at the trouble to ſtrip off the bark.

The poles moſt generally approved and made uſe of in England are thoſe of aſh, which are tough and ſtrong, and laſt ſix or ſeven years. Willow poles are alſo in eſteem; but thoſe of cheſnut are the moſt durable.

When the poles are ſet as above directed, and the vines are grown two or three feet high, ſuch of them as have not taken the poles of themſelves ſhould be guided by hand to ſuch poles as are neareſt and have feweſt hops. The ſtrongeſt vines ſhould always be allotted to the talleſt poles. Two ſtrong, or three weak binds are ſufficient for a pole. They ſhould be bound about the pole at equal diſtances, according to the courſe of the ſun, which they conſtantly follow; and ſhould be bound with dry ruſhes, or woollen yarn, but not ſo cloſe as to hinder their climbing up the poles; for if they are tied too hard, they will decay and die. Two or three bindings are ſufficient for each pole. In doing this, very great care ſhould be taken not to break the young ſhoots, which are more tender and brittle in the morning, than in the heat of the day. Women are therefore generally employed for this buſineſs. When the choſen ſtrongeſt plants of hops have begun to take to and twine round the poles, all the other week vines ſhould be cut off cloſe to the hill.

The hops ſhould be tended conſtantly during the months of April and May, to guide them to their poles. If the vines are not able to ſupport and keep themſelves to the poles, give them a ſecond tying as high as you can reach; and if they forſake the pole after they are grown beyond the reach of your hand, a forked ſtick, or a ladder with a ſtay to the back, will be uſeful to tie them up again. If the vines are ſtrong, and much over-grow the pole, ſome adviſe to ſtrike off their heads with a long ſwitch, in order to increaſe their branching below.

About Midſummer, or a little after, hops ceaſe to run up in height, and begin to branch. To ſuch as do not, it will be right to ſtrike off the top with a ſwitch, or to divert it from the pole, that it may branch the better: wherever the top or leading ſhoot of a vine is broken off, it will run no farther in length, but will put out branches from the next eye or knot, and theſe, if carefully managed, will take to the pole, and yield a much better crop than the hop would do if ſuffered to ſpend itſelf by running into length of growth.

Having dreſſed, poled, and tied your hops, as before directed, give the ground a good ſummer digging, ſome time in May, eſpecially after rain, or at leaſt turn up it's ſurface, pretty deep, with a ſpade, breaſt-plough, or hoe-plough; throw ſome of the fine earth on the hills, and enlarge their breadth, cutting away and burying all ſuch ſuperfluous roots or hops, and weeds, as appear on the hills or alleys. This will prevent the hops from being impoveriſhed by weeds, and will alſo keep the hills moiſt. The hills muſt not by any means be made up and finiſhed all at once, but by degrees, and at different times. Two or three hoeings, at leaſt, are requiſite in the courſe of the ſummer, and at each of them a little fine earth ſhould be laid on the hills, eſpecially after rain, the better to nouriſh the roots of the plants, and to keep the hills looſe, open, and moiſt. Though it be a general rule, whenever you weed the hills, or hoe the alleys, to caſt ſome fine mould on the hills, yet this admits of an exception; for when you find the vines very vigorous and full of ſap, you muſt forbear giving them any more earth, becauſe exceſs of nouriſhment will make them run too much to ſtalk, and thereby prevent their branching out, and conſequently their bearing ſo many bunches of hops, as they would do if leſs luxuriant. You may at any time add to the ſap by enriching the hills, but cannot withdraw the redundancy at pleaſure.

The fewer weeds you have in your ground, the more hopes you will have on your poles: therefore ſuffer no weeds to feed on the hop-ground.

The common ſize of the hills, when they are fully completed, is ſomewhat more than two feet broad, and about a foot and an half high. In low, moiſt, or rich grounds, the hills ſhould be higher and larger: but in dry, ſhallow, higher grounds, they are made ſmall. The higher hills produce larger roots and binds, and better ſets.

In Auguſt, when the hops begin to be in bell, pare again all the alleys clear from weeds with a hoe or ſharp ſhovel, and throw the lighteſt of the earth on the tops of the hills, ſo as to make them as large as a buſhel; but be careful not to throw on any weeds, nor to cut any of the binds with the ſhovel. Then too, eſpecially if the hops are at all deficient in point of vigour, a good deep ſtirring of the alleys will be of ſingular ſervice to them. At the ſame time, or rather ſomewhat before, women ſhould be employed to ſtrip the leaves from the vines to the height of two or three feet above ground, in order to give the hops the more air and ſun, and to help their ripening.

Hops, in the uſual way of managing them, are often ſo greatly checked in their growth by a very dry ſpring, eſpecially at the time when they ſhould branch moſt, and even when they are in bloſſom, that it becomes neceſſary to water them, either by flowing the alleys by means of a ſtream properly ſituated on a higher ground, and then paring off their ſurface and laying it upon the hills, to keep them moiſt; or even by the tedious and expenſive method of bringing water on by hand, and pouring a pail full of it into a hole made with a ſtick, or iron crow, in the middle of each hill: and if the weather ſtill continues dry in the ſummer, this muſt be repeated two or three different times.—Can any thing be more ſtriking than the evidence which reſults from this well known fact, of the vaſt advantage of cultivating hops according to the principles of the horſe-hoeing huſbandry, in which the earth is kept conſtantly looſe; and thereby moiſt, even in the very drieſt ſeaſons, by deep and frequent ſtirring of the alleys? It highly deſerves the moſt ſerious attention of every planter.

Towards the latter end of July hops begin to bloſſom, about the beginning of Auguſt they bell, and, in forward years, they are ſometimes ripe at the end of Auguſt, or beginning of September. When they begin to change colour, or are eaſily pulled to pieces, when they emit a fragrant ſmell, and when their ſeeds begin to look brown and to grow hard; you may conclude that they are ripe: then pick them with all expedition; for a ſtorm of wind will do them great miſchief at this time, and hops picked green and bright, without bruiſing or diſcolouring, will ſell for a third part more than thoſe that are otherwiſe.

When the poles are drawn up in order to be picked, the vines around them ſhould be cut aſunder at the height of about three or four feet from the ground; for the cutting of them lower, eſpecially while the hops are green, would occaſion ſo great a flowing of the ſap, as would weaken and hurt the root.

If the poles ſtick ſo faſt in the ground as not to be taken up without difficulty and hazard of breaking them, they ſhould be raiſed by a piece of wood in the nature of a lever, having a forked piece of iron, with teeth on the inſide, faſtened within two feet of the end.

The moſt convenient way of picking them is into a long ſquare frame of wood, called a bin. This frame is made of two poles, or pieces of wood, each nine or ten feet long, and three or four inches thick, joined together at about a foot and an half from each end by two other pieces three feet long, and it is ſupported by four legs three feet and an half high, ſo that there remain in the middle of it a ſpace ſix feet long, three wide, and three and an half deep. In this ſpace is fixed a coarſe linnen cloth, or hop-bag, cut open on one ſide, and hung hollow, either by hitching it on tenter-hooks along the inſide of the frame, or by ſtitching it on the outſide with wooden ſkewers, to receive the hops as they are picked. Three men or women, or four boys or girls, may ſtand at each ſide of the frame, and pick two poles at a time.

When you have raiſed ſome poles, bring them with the hops and vines on them, and lay them lengthwiſe upon the frame; or erect a forked prop at each end of the frame, and reſt the poles thereon in order to their being picked. There is no occaſion to ſtrip the vines or haulm from off the poles before they are picked. The workman who raiſes the poles generally carries them to the frames, and theſe being light, may be eaſily removed from one part of the hop-ground to another.

The ripeſt hops ſhould be firſt picked: but if the hops appear to be equally ripe in all parts of the plantation, it is beſt to begin to pick them on the Eaſt or North-ſide of the ground, the more effectually to guard againſt the South-weſt wind's breaking into the garden.

Having choſen a ſpot of ground which contains eleven hills, place the bin upon the hill which is in the center, and after theſe are picked, remove it into another ſpot of the ſame extent, and ſo proceed till the whole is finiſhed.

The hops ſhould be picked as free as poſſible from leaves and ſtalks, for theſe would be of greater prejudice to the ſale, than any ſeeming advantage which might be expected from their weight. The bin ſhould be emptied two or three times a day into a large cloth of coarſe linnen, in which the hops ſhould be immediately ſtitched up with ſkewers, and carried directly to the oaſt, or kiln, to be dried: for if they remain long in the bin, or cloth, they will ſweat and be diſcoloured.

If any brown hops are met with in the picking, care ſhould be taken to ſeparate them from the reſt, by putting them into a baſket by themſelves.

If the weather be very hot, or rainy, cut no more hops than may be picked in an hour; but, if it be poſſible, gather them in fair weather only, and when they are dry; for this precaution will ſave ſome expence of coals, and contribute to the better preſervation of their colour when they are dried. No hops ſhould be gathered when the dew is on them, for that would make them become mouldy.

When you have taken the poles from the hills, twiſt together the remaining ends of the binds, that they may not get among people's legs, and hinder their work.

Before you draw the poles, obſerve whether the hops of one pole be entangled above with thoſe of another, and if they are, cut them aſunder with a ſharp hook fixed at the end of a long pole.

If the garden be large, it may be worth while to raiſe a ſhed in the midſt of it, to ſhelter the pickers and the hops from the ſun and rain; and to lay hops in overnight, to be picked early the next morning before the dew is off the other hops. This ſhed will alſo ſerve for preſerving your poles in winter.

If there be either dew or rain upon the hops at the time when they muſt be gathered, ſhake the pole, and they will dry the ſooner. If they are over-ripe when gathered, they will ſhed their ſeeds, in which the chief ſtrength of the hop conſiſts; nor will they then look ſo green, but ſomewhat brown, which is a great diminution of their value. It therefore is better to pull the hops, a little before they are ripe, than to wait till they are full ripe. Four pounds of undried hops, thorough ripe, will make one pound of dry; and five pounds of hops ſcarcely ripe, though in their full prime, will make no more when they are dried.

There are two principal ſorts of hops, *viz.* the green and the brown. The former yields by much the beſt colour when dried, and the other is the moſt plentiful bearer.

Brown hops are fit for brown ale, but the hops for fine pale beer muſt be green; for which reaſon theſe laſt are moſt eſteemed.

As faſt as you pick hops, dry them on a kiln; otherwiſe they will change colour: but if yon cannot dry them immediately, and muſt keep them a little while, ſpread them on a floor, and by that means the damage which they will receive in a day or two will not be great.

They who have five or ſix acres of hops, may employ ten frames at a time in picking.

If any of the rath-ripe, or early hops, which bloſſom and ripen a week or ten days ſooner than the other ſorts, happen to be intermixed in the ſame plantation, they ſhould be watched carefully, in order to their being gathered in time; for if they hang till they are over-ripe, they will ſhed their ſeeds, turn brown, and thereby not only become bad themſelves, but ſpoil the ſale of the others with which they are mixed. It is therefore adviſable to mark at the bloſſoming ſeaſon, the hills in which they are, in order to dig them up and replant thoſe ſpots: for the trouble of pulling them up ſeparately, when they are ſcattered here and there in a hop-ground, and of carrying them, ſometimes a conſiderable way, to a convenient place, to be picked, is very great, and cannot be avoided otherwiſe than by either baniſhing them totally, which would not be quite conſiſtent with the huſbandman's profit, as they fetch a good price by their coming firſt to market; or, which is the beſt way, by planting them in a garden by themſelves.

Very particular care ſhould be taken that the hops be thoroughly and equally dried. In this lies the greateſt difficulty and art in the management of them: for if they are over-dried, they will change colour, look brown, and be judged to be burnt, whereby their value will be greatly diminiſhed; and if they be under-dried, they will loſe their colour and flavour. Experience has ſhewn, that an handful only of under-dried hops will ſpoil many pounds of others, by taking away their fine ſmell and colour.

The beſt way of drying them is with a charcoal fire, on a kiln covered with hair-cloth, of the ſame form and faſhion as is uſed for drying of malt, under which head this common ſort of kiln will be more particularly ſpoken of hereafter. It is

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found to ſuffice in places where only a few hops are raiſed, and a great deal of malt is made: but where the hop-planters have a much greater quantity of hops than can be dried in due time on their malt-kiln, (for hops, as was ſaid before, ought to be dried as ſoon as poſſible after they are picked,) they build, in the following manner, ſeveral ſmall kilns on purpoſe for drying of hops.

*EIGHT* or ten acres of hop-ground require a building of about ſixty feet long, and fifteen wide in the clear. At one end of this building is a boarded room, to receive the green hops which are brought from the hop-ground, and which lie ſpread out there till there be room to put them on the kilns: at the end of the buildings is another large boarded room, for receiving the hops from the kiln when they are dried, and for them to lie in heaps to ſweat till they are fit for bagging. In the intermediate part of the building, three or four kilns, of eight or ten feet ſquare each, are conſtructed thus, cloſe to one another.

If the middle building is, we will ſuppoſe, twenty eight feet long and fifteen wide, there will be room for three kilns of eight feet ſquare each in the clear, and for their reſpective walls. Theſe kilns ſhould lie in a line along the back wall, and will come forward above nine feet; ſo that there will remain a paſſage five feet wide and twenty eight feet long at the front of the kilns.

To form each kiln, build the walls of brick, nine inches thick, and let each of the four ſides be eight feet long in the clear, and ſeven feet high. The principal parts of the kiln are, in the upper part, the bed or floor whereon the hops are to be laid in order to their being dried; and in the under part, the furnace, ſteddle, or lanthorn, for the fire. The bed or floor in a kiln of eight feet ſquare ſhould be about ſix feet from the lower floor, ſo that it will be about a foot below the top of the wall. This foot of wall riſing above the bed, ſerves to keep on the hops in the kiln, and for men to walk upon round about the kiln, to look to the drying of the hops. The bed, or floor, may be made of wooden rails an inch ſquare, laid very even and level, into a croſs beam, a quarter of an inch aſunder, or if the kiln be arched below, the floor may be laid with long bricks, or ſtones reſting on the tops of the arches, at about two inches diſtance from each other.

In making the lower part of the kiln, place the mouth of the furnace at the bottom, in the middle of the front wall of the kiln, and let it be fourteen inches wide and ſixteen high. Joining to the mouth of the furnace on the inſide, build the ſteddle or lanthorn, of brick, four inches thick. This lanthorn ſhould be fourteen or ſixteen inches wide, three feet perpendicularly high in the ſide walls, and it ſhould reach from the front wall of the kiln to within a foot and an half of the back wall: ſo that there will be room for a man to paſs between it and the back wall, and the length of the lanthorn thus made will be about ſix feet. On it's ſide walls, bricks of a foot length are to be raiſed on their ends, leaning to and bearing upon one another, ſo as to form a covering like the roof of a houſe; or the top of the lanthorn may be regularly arched over.

In building the ſide walls of the lanthorn, after you have laid the two firſt rows of brick, leave at the end of every brick in the three or four following rows, an open ſpace or hole, four or five inches wide, chequer-wiſe, both in the ſides and in the back, and lay the uppermoſt row or two of bricks cloſe together, as in the bottom rows, for the better ſupport of the roof. By this means there will be three or four rows of holes, which are deſigned to convey the heat equally to all parts under the hair-cloth. The roof ſhould be well plaiſtered on the inſide with hair and lime, that it may the better reflect the heat.

In the front-part of the kiln, on one ſide of the furnace, and at the height of two feet from the ground, a ſmall door ſhould be made, three feet high and two wide, ſo that a man may eaſily get in to ſet every thing to rights about the ſteddle. There ſhould alſo be ſteps or ſtairs to go to the upper floor, where the hops are dried; and as there is a paſſage below, five feet wide, along the front of the kilns; ſo will there be, directly over head on the upper floor, a like paſſage, which will be of uſe for bringing the green hops from their room, and laying them on the kiln, and for carrying them to the ſtore room after they are dried. For greater conveniency, both theſe rooms ſhould be on the ſame floor as the upper part of the kiln.

A farther caution neceſſary to be obſerved, is, that no holes be made within a foot of the fire-place or mouth of the furnace, and that all the parts about the kiln be conſtructed ſo cloſe that no wind or air may poſſibly get in. The farther end of the ſteddle ſhould be built of brick up to the top, with holes in it as in the ſides.

The kiln ſhould be ſquare, and may be ten, twelve, or fourteen feet over at the top; but there ſhould be a due proportion between the height and breadth of the kiln, and the ſize of the ſteddle where the fire is kept, *viz.* if the kiln be twelve feet ſquare on the top, it ſhould be nine feet high from the fire, and the ſteddle ſhould be ſix feet and an half ſquare, and ſo proportionably in other dimenſions. Theſe kilns are made at a ſmall expence.

*IN* drying of hops, firſt lay the hair-cloth very even on the bed or floor of the kiln, and ſpread the green hops thereon, about ſix inches thick, laying them with a rake as ſmooth as poſſible, not thicker in one place than another. Let the kiln be moderately warmed before you lay on the hops; then keep an even and ſteady fire under them, but not too fierce at firſt, for fear of ſcorching them; and let not the fire ſlacken, but rather increaſe it till the hops are nearly dried, leſt the moiſture or ſweat, which the fire has raiſed, fall back and diſcolour the hops. For theſe reaſons chiefly it is, that no cool air ſhould be ſuffered to come into the kiln while the hops are drying, and that wind, which would make the fire burn too violently, ſhould not be permitted to blow on the mouth of the furnace. After the hops have lain thus about ſeven, eight, or nine hours, have left off ſweating, and leap up when beaten with a ſtick, then turn them upſide down with a broad malt ſhovel, or ſcoop made for that purpoſe, or caſt them up into a heap in the middle, and afterwards ſpread them equally on all ſides. Let them remain in this ſituation for two or three hours more, till every hop, if poſſible, be thoroughly and equally dried; and then, with a hair-cloth, remove them to the heap where they are to lie till they are bagged. If they do not dry in one place ſo much as in the reſt, which may be perceived by touching them with a ſtick or wand, and obſerving whether they rattle when ſo touched, as they will do when dry; make them thinner in the places where they rattle leaſt. They muſt not be turned while they ſweat; for that will burn them and make them loſe their colour. The fire may be diminiſhed a little before they are turned, and refreſhed again afterwards; but thoſe times excepted, the heat ſhould be kept as equal as poſſible.

Hops are fully dried when their inner ſtalks become brittle and break ſhort on rubbing, and when their leaves fall off eaſily and feel very criſp. When they crackle and leap a little, as they will do upon the burſting of their ſeed, then is the time to take them off the kiln.

If the fuel uſed for this purpoſe be either wood or turf, it ſhould be charred firſt, becauſe ſmoke ſpoils the colour and ſmell of hops. Char-coal made of old rotten poles is moſt commonly uſed. Cinders of ſea-coal are alſo very good; and it is found by experience that Kilkenny coal dries hops perfectly well, becauſe it does not ſmoke, and gives a conſtant uniform heat for a long time. The fire ſhould be made at the mouth only of the furnace; for the air will diſperſe the heat ſufficiently from thence to all parts of the kiln: and that it may be conſtantly of the ſame gentle degree, neither too ſtrong nor too weak, it may be of ſervice to make uſe of a thermometer, by marking upon which the degree of heat proper for drying hops, as ſoon as that degree is aſcertained by experiment, you may always after know how to regulate your fire with great exactneſs: for, putting the thermometer within-ſide the kiln for a ſhort time, you may obſerve, by the height of the liquor, when the heat is come to a right pitch, and when it is either too high or too low, and ſo encreaſe or ſlacken the fire accordingly. Any ſervant may, with the help of this inſtrument, be able to mend and correct the fire with great certainty, and not be liable to commit miſtakes, which often prove exceedingly detrimental to the hops.—When you begin drying, loſe no time in the proſecution of that work, but employ people night and day, to attend it with the utmoſt care, till it be finiſhed.—A large malt-ſhovel full of char-coal, thrown into the mouth of the furnace of a kiln eight feet ſquare, will laſt an hour.

It is obſerved that hops dried in the ſun loſe their richneſs of flavour, as other herbs do when they are dried that way.—If they are laid on a floor to dry, without uſing a fire, they will loſe their ſtrength, be apt to ſweat or ferment upon change of weather, and not be fit for packing. Fire exhales their watery parts, and, by retaining the oily, preſerves their flavour and colour.

*HOPS* break all to powder if they are bagged hot from the kiln. To prevent this, they ſhould be laid in a heap, to ſweat and grow tough; and if they are then covered for a while cloſe with blankets, to keep the air from them, they will bag the better. There is no limited time for their ſweating; that varying according to the weather: three or four days are commonly ſufficient; but it is a certain rule, that when the hops feel moiſt and clammy, and can be ſqueezed in the hand, or trodden cloſe, without breaking, they are then fit for bagging. The harder they are trodden, the better they will keep.

The bags proper for this occaſion are made of coarſe linnen cloth. They are commonly about eleven feet long, and near two yards and an half in circumference, and contain about two hundred and an half weight of hops. The ſmall bags, called pockets, contain about half that weight.

The manner of bagging is thus: Make a round or a ſquare hole, but a round one is moſt convenient, about twenty ſix or thirty inches over, in the floor of the chamber where the hops are laid in heaps after they are ſweated. This hole ſhould be large enough to receive the bag, and for a man to go up and down it with eaſe. Tie, with a piece of packthread, an handful of hops in each lower corner of the bag, to ſerve as handles for the more eaſy lifting or removing of the bag; and, with packthread, faſten the mouth of the bag to a frame, or hoop, ſomewhat larger than the mouth of the hole, that the hoop may reſt on it's edges, and ſtrong enough to bear the weight of the hops when the bag is full, and of the man who treads them. The upper part of the bag being thus fixed to the hoop, let the reſt of it hang down through the hole; but not ſo near to the lower floor as to touch the ground: then throw into it a buſhel or two of hops, and let a man go into the bag, and with ſhoes that have no heels, tread the hops down on every ſide, as hard as he can, till they lie cloſe. Let more hops be then caſt into the bag, and be trodden down, as before; and continue this till the bag is full. When that is done, untie it from the hoop, let it down, and ſew up it's mouth as cloſe as you can; obſerving at the ſame time to tie up ſome hops in the upper corners, as was done before in the lower.—The harder the hops are preſſed, and the cloſer and thicker the bag is, the longer and better the hops will keep.

When they are thus bagged, lay them upon a boarded floor, and in a dry place; for dampneſs would injure them greatly. At the ſame time all proper meaſures muſt be taken to guard againſt rats and mice, which, though they do not eat hops, are very apt to ſpoil them, by making neſts and lodging in them.

Some, in treading the hops, uſe a fifty pound weight, faſtened to a rope and placed in the middle of the bag. The man in the bag treads about it with his feet, and lifts it up now and then, to preſs them the cloſer together.

*AS* ſoon as the hops are picked, ſtrip their haulm or vines from off the poles, and, as your laſt work, lay the poles up ſo that they may be preſerved. This is done either by ſtacking, piling, or houſing.

The ſtacking is performed thus. Set up three poles, like an erect triangle, or rather ſix poles, let into the ground with an iron crow, and placed circularly, but inclining to one another ſo as to meet, and be tied faſt together with bands of the haulm of the hops, within a yard of the top. The poles deſtined for the ſame ſtack ſhould then be erected ſpeedily againſt this frame; for if they are ſuffered to lie on the ground, eſpecially in wet weather, they will receive more damage in a fortnight, than by their ſtanding out, upright, all the reſt of the year. When they are ſet up, about three hundred to a ſtack, bind them round with a rope of twiſted haulm, to keep them together. By this means the outer poles only are ſubject to the injuries of the weather, and keep all the inner ones dry, excepting at their tops and bottoms, the former of which are, for the moſt part, expoſed to the air, as the latter are to the moiſture of the earth. It is therefore a good method to cover the top of the ſtacks of poles with haulm, and to lay ſtones, bricks, or ſand, at their bottom, to preſerve their but-ends from rotting.

Many chuſe to pile them up lengthwiſe in different parts of the hop-ground, laying three or four old poles athwart at bottom to preſerve them from the dampneſs of the earth, and ſetting ſeveral poles erect in the ground on each ſide of the pile, to prevent its ſlipping: they then lay the poles on one another, placing the ſmaller ends inward, and the bigger outward: ſo that the pile ſhould conſequently be ſomewhat longer than the poles: and when it is raiſed high enough, they bind it acroſs with ropes or haulm, to keep it upright and ſteady, and then cover it with haulm, to defend the poles from rain. This is a better method than the former: but the beſt way of all to preſerve the poles, is to build in the hop-ground a ſhed or two, which may ſerve as a ſhelter for picking the hops in ſummer, and for laying up the poles in winter, with leaſt danger of their being hurt or ſtolen.

*FROM* October to March there is nothing to be done in the hop-ground but to provide and bring manure into it, and to give the alleys their winter's digging or plowing.

If you bring dung into your ground, be ſure it be well rotted, and lay it on the alleys to mix with the earth, but not on the hills; dung being apt to produce vermin, which are extremely injurious to hops. Cold dungs, ſuch as cows and hogs-dung, are better for hops than horſe-dung, unleſs the ſoil be cold and wet, and then hot dung, ſuch as that of ſheep, and even of pigeons, will not be improper.

A ſmall dunging every ſecond year is ſufficient, and a plentiful dunging will ſerve for three years, if the ſoil be tolerably good.

Dung was formerly more in uſe for hop-grounds than it is at preſent; experience having ſhewn that lime, lime-ſtone, gravel, ſea-ſand, marle, eſpecially the ſhelly marle, aſhes, and many other manures and compoſts, which have been pointed out in the beginning of this work [a] as the moſt proper means of correcting the defects of ſoils, anſwer the end better, and laſt much longer.

The management of the hop-ground during the third and every ſubſequent year (for it will continue to yield good crops during upwards of twenty years, if it be rightly cultivated), is the time as above directed; ſo that it will require pretty conſtant care and attendance, eſpecially from the beginning of March to the end of September. This you may lay down as a certain rule, that the more pains you take, and the greater expence you are at in the due culture of the ground and management of the hops, the greater will be your profit.

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[a] See *Vol.* I. *c.* 1.

*THE* charge of an acre of hop-ground, in moſt parts of *England* where hops are cultivated, is computed thus: 3 *l.* for the huſbandry, 4 *l.* for the wear of the poles, 5 *l.* for picking and drying, 1 *l.* 10 *s.* for dung, 1 *l.* for rent, and 10 *s.* for tythe; in all 15 *l.* a year: but in ſome places they pay 4 or 5 *l.* an acre yearly for the rent of the land.

The hop-planters in England commonly agree with hop-dreſſers, to do, for 3 *l.* to 3 *l.* 10 *s.* an acre, all the husbandry part, in which is included the ſummer and winter digging of the ground, the pruning and dreſſing of the hops and hills, the poling and tying, ſeveral hoeings and making up the hills from time to time, the laying of the dung on the ground, and all other work, except the bringing of the dung to the ground, and the picking and drying of the hops, which laſt buſineſſes are performed by others: ſo that a gentleman has little trouble with his hop-ground:—he need only be careful that the undertaker does every part of the work in its proper ſeaſon; and it is ſo much the intereſt of the undertaker to be punctual in this, that, if he neglects hoeing when the weeds appear, he will, by ſuch neglect, greatly multiply his trouble and labour in rooting them out afterwards.

An Engliſh acre requires about three thouſand poles, the price of which varies according to their ſize. In ſeveral places, it is uſual to give as many ſhillings for an hundred poles, as the poles are feet long; ſo that, for an hundred poles of twenty feet long, they give twenty ſhillings: but where poles are in great plenty, they give but fifteen ſhillings for thoſe of that length. A recruit of five hundred poles yearly will keep an acre of hop-ground in conſtant repair: ſo that poles are about a third part of the yearly charge, the picking and drying are eſtimated at another third, and the reſt is laid out in the managing of the ground.

The hop planters in England reckon that they have but a moderate return when the produce of an acre of hops does not ſell for more than thirty pounds. They frequently have fifty, ſixty, eighty, or an hundred pounds for an acre; nay, ſome have got conſiderably more than even this laſt ſum for every acre of hops, at a time when the crops of other hop-grounds have failed in general, and theirs have ſucceeded. But if, on one hand, ſuch extraordinary profit, being very uncertain, is not to be depended on; ſo, on the other, it ſhould not be paſſed over quite un-noticed, becauſe it is among the chances which may make amends for failing years. — Upon the whole, if the total charge of an acre of hops is computed, as above, at fifteen pounds a year, and its produce, at an average of years, at thirty pounds only, the clear profit from an acre will be fifteen pounds a year.

Though it be common in England to ſee ten, twenty, thirty, or more acres of hop-ground in the hands of one man; and though ſome who ſpare neither care, induſtry, or expence, to make their plantations of this kind flouriſh, receive two thouſand pounds a year for their hops, notwithſtanding the high price of labour, manure, and every other article relating to their proper management; yet the intelligent husbandman will eaſily perceive, that it is not prudent for poor farmers, or men of ſmall fortune, to engage far in this branch of improvement: for it requires a pretty conſiderable ſtock at firſt to cultivate a large plantation, to furniſh it with poles, and to perform every other requiſite. The expence will neceſſarily be great, and the undertaker muſt expect to lie out of his money for two or three years, before he can have any return of profit; — and even when his hops do come to their bearing ſtate, and he is in hopes of making good the charges he has been at, a bad ſeaſon may fruſtrate his expectation. — Small parcels of hops, ſuitable to the abilities of the farmer, for even the pooreſt may eaſily ſpare time and labour to plant a few of them in a corner of his garden, or other ground, and to ſet ſallies, willows, or aſh for poles in his hedges or elſewhere, will yield him a pretty profit, without his laying out any money: — ſo that, in ſetting forth the expences and riſk which attend the cultivation of hops, I mean only to caution the huſbandman, whoſe circumſtances are but middling, againſt embarking too far in this branch of agriculture.

*GROUND* that is fit for the raiſing of hops, is alſo fit for the raiſing of Hop-poles of one kind or other. But to be more particular: low, wet, cold, marſhy, boggy ſoils, or ſuch as are ſituated near rivers, are fit for all the aquatic ſorts, ſuch as poplars, abeles, alders, willows, oſiers, and ſallies, which will produce hop-poles in four or five years from their firſt planting. If the ſoil be dry and warm, or a ſtrong mellow rich loam, the aſh and the cheſnut, which make the beſt poles for hops, will thrive greatly therein, and be fit for poles in nine or ten years from the time of ſetting them: and if theſe are planted around the hop ground, they will both ſhelter the ground, and afford a ſupply of poles, without the expence of carriage. Elms alſo are quick growers; and when they are planted cloſe together, they ſhoot up tall and ſtrait, and make good poles.

Aſh and cheſnut poles, but eſpecially thoſe of cheſnut, are ſo tough and durable, that three ſets of them will laſt twenty years: but poles of alder, poplar, abele, oſiers, or ſallies, ſoon rot, or become brittle; ſo that five ſets of them, at leaſt, will be requiſite within that time. The aquatic kinds are therefore to be eſteemed only for a firſt ſupply, till the plantations of aſh and cheſnut become fit for the future recruit of the hop-ground.

If the ground in which you deſign to plant alders, poplars, abeles, willows, oſiers, or ſallies, be very wet, make drains in it to carry off the ſuper-abundant water: then, in the beginning of winter, dig the whole ground as deep as you can, divide it into ridges or beds ſix feet wide, and make a ſmall trench of a foot and an half wide, and a foot deep between each bed. If this ground will bear plowing well, you may ſave yourſelf ſome expence; but you will find that trenching with the ſpade will make ample amends for the charge, by the quicker and ſtronger growth of the trees. The ground being thus prepared, ſet about planting it in February following. Poplars and abeles are generally propagated from ſuckers, and theſe ſhould be planted as ſhallow as poſſible: but they may alſo be increaſed from large cuttings or truncheons, or from branches of the laſt year's growth. Alders, willows, ſallies, and oſiers, are propagated from large cuttings or truncheons a foot and an half or two feet long, and the thicker they are the better they will be.

The truncheons ſhould be cut ſloping at the ends, and there ſhould be two or three eyes towards each end. When you plant them, ſet them three feet aſunder, and do not drive them down perpendicularly, but place them ſloping in the earth, leaving about ſix inches above ground. Take care not to bruiſe or ſtrip off the bark in thruſting them into the earth; but, to prevent this in ground that is ſtiff and hard, make a hole with an iron crow, or with a ſetting-ſtick, then put them into it, and afterwards cloſe up the holes very firmly about them with fine mould. If the ground is looſe, there will be no occaſion for making holes with a ſtick.

Theſe plantations ſhould be kept clean from weeds during the two firſt years, by frequent hoeing: after that, they will of themſelves keep down all weeds. All ſide-buds or ſhoots muſt be carefully rubbed off in the beginning of every ſeaſon, to make the plants grow the taller and ſtraiter. Preſerve at firſt but one good leading ſhoot, or two at moſt, on theſe truncheons, and in four or five years they will be large enough to make poles. When theſe are cut down, you may preſerve five or ſix good ſhoots on each ſtock, and thin them as you find occaſion. Lay the cuttings of alder in water for the ſpace of two days before you plant them; and let the poles from all theſe trees be cut either in October before winter comes on, or in February when the winter colds are paſt.

Aſh thrives beſt in the richeſt ſoil, and is generally raiſed from its ſeed, commonly called *keys:* for the ſuckers of this tree ſeldom have good roots, nor do they grow with near ſo much vigour as thoſe which are raiſed from keys. Theſe keys are gathered about the end of November, when they begin to fall, or in the beginning of December. They ſhould then be buried in a hole in the ground, placing a layer of keys and a layer of mould alternately till the hole is full, and they ſhould remain there till the February twelvemonth, when they ſhould be taken up, and ſown in ſeed-beds; or they may at firſt be put into ſeed-beds, where they ſhould not be buried above two inches deep at moſt: but ſtill they will not come up till the ſecond ſpring after ſowing. During this time, they ſhould be carefully kept clean from weeds, and watered in very dry and hot weather.

When the young plants of aſh are come up, they muſt be watered during the ſpring and ſummer, if the ſeaſon be dry, and kept conſtantly weeded. In October following, take them out of the ſeed-bed with a trowel, to prevent their roots being ſtrained in drawing; for when this happens, they not only never grow well, but generally periſh, after they are tranſplanted. When you remove them from the ſeed-bed to the nurſery ground, prune off their downright or tap-roots, but not any of their ſide roots. Their tops muſt not be cut in any manner till the ſecond year after tranſplanting, but then their heads ſhould be cut off within an inch or two of the ground, becauſe this will make them ſhoot with great vigour in the next ſpring.

If the ſeedlings are ſmall at the end of the firſt year, it is beſt to let them remain in the ſeed-beds a year or two longer, until they are large enough to tranſplant, which is when they are about the bigneſs of a gooſe-quill. Let the nurſery ground be well dug, made very fine, and cleared thoroughly from weeds: then, in the beginning of winter, tranſplant the ſeedlings into beds in it, ſetting them a foot aſunder every way, in ſtrait lines, and leaving an alley two feet wide after every fourth row. When they have continued in this nurſery two or three years at moſt, they ſhould be tranſplanted into the places where they are to remain.

In tranſplanting them from the nurſery, which ſhould be done in October, or in February if you have ſlipt that time, take care not to bruiſe or ſpoil the roots, and preſerve as much earth about them as you can. Let the ground be well dug and prepared ſome time before hand, and ſet the plants of aſh in it three or four feet aſunder. This ſoil ſhould be good, and not wet; and it ſhould be hoed and dug frequently about the plants during at leaſt the firſt year or two after their being tranſplanted.

Another method of raiſing coppices or plantations of aſh, which is attended with leſs charge and trouble than the former, and ſeldom fails of ſucceſs, is this:

Make choice of very good land, and after giving it a ſummer's plowing to mellow it, and to deſtroy the roots of weeds and graſs, eſpecially couch-graſs, prepare it for barley to be ſown in the ſpring, and at the ſame time that you ſow your barley, ſow alſo aſh-keys, but not at all thick. By this means, as the keys will not come up till the next ſpring after ſowing, you will have the benefit of a crop of barley the firſt year. Early in the ſpring following, give the land a hoeing, which, though it ſhould be little more than ſuperficial, will help to mellow the earth, and looſen it ſo that the tender ſhoots of the ſeeds will pierce eaſily through it.

When the young ſeedlings have riſen high enough to ſtand the hoe, thin them ſo as to leave but one promiſing plant at the diſtance of four or five feet from each other. The oftner the earth is ſtirred about the ſeedlings by hoeing it, the better they will thrive. In the beginning of the following winter, the ſurface of the ground ſhould be lightly dug about half a ſpit deep, that the tender fibres may eaſily ſtrike therein: afterwards it ſhould be hoed in the ſpring, when the weeds begin to riſe; and theſe works ſhould be continued till the ſhade of the nurſery prevents the farther growth of weeds, which it will do at the end of three or four years.

There is likewiſe another way of planting young trees, which has been practiſed with ſucceſs in ſeveral places at a ſmall expence, and may be thus applied to the raiſing of hop-poles. Chooſe a piece of ley ground, of a proper ſoil, and ſheltered on all ſides, eſpecially the Weſt; and lay it out in ridges, as for potatoes, making trenches a foot and an half wide and two or three ſpits deep: when you have laid the upper ſod on one ſide of the trench, with the graſs ſide downward, break the mould of it fine, and throw a little more fine earth from the trench upon it; then take a young aſh from about ten to fifteen inches long, having before cut off the head to that length, and lay it on the fine earth, with the roots turned inwards, as in the planting of quicks; then cover it with three or four inches thick of fine mould taken from the trench, but leave about two inches of the top of the plant uncovered on the ſide of the trench. At two or three feet diſtance ſet another aſh, in the ſame manner, and ſo proceed till you have planted the whole field. When you have laid the freſh mould on the roots, cut the graſs ſods which lie between each plant, and lay them over the fine mould upon the plant with their earth ſide downward; by which means the plants will have ſmall hillocks of good mould about them, ſufficient to defend them from drying winds and from the heat of the ſun. Let the ridges be ſix or ſeven feet wide; in which caſe the trees will be two or three feet aſunder in the row, and each row will be ſix or ſeven feet diſtant from another; ſo that all the trees will have ſufficient air, and room to ſpread their roots, and may be very eaſily hoed or weeded. In planting trees after this manner, you dig but about a fourth of the ground: but for ſeveral years after, and until the trees are grown up to be large and ſpreading, half of the ridge may be made uſe of either for potatoes or for any other fruit or grain.

It is recommended as very material to the growth of trees planted in this manner, that the trenches be made from the South-weſt to the North-eaſt, ſo that all the young trees may lie facing the ſouth-eaſt, by which means they will have the benefit of the ſun, with leaſt danger of being injured by the Weſt, or North-weſt winds, which ſtint the growth of all young trees that lie expoſed to them.

Elms, beech, and many other trees may be raiſed in great plenty, by planting in fine mould the ſmall ſhoots of the laſt year's growth, after they have been ſlipped off from the larger branches. One large tree will furniſh a great number of ſuch ſhoots, which ſhould be ſet in February, with their tops on, and watered in the ſpring. Theſe plants ſeldom fail; and they furniſh a ſupply of trees much ſooner than can be obtained from ſuckers, layers, or ſeeds.

Some adviſe the ſowing of cheſnuts, acorns, and hazle-nuts, with aſh-keys; becauſe, ſay they, as ſome of theſe ſtrike their roots deeper than others, they are leſs liable to rob one another of their due nouriſhment, than if they all rooted at the ſame depth. Theſe nuts ſhould be kept in moiſt ſand from the time of their being gathered till they are ſown, or otherwiſe their kernels will ſhrivel and periſh.

Cheſnuts make admirable poles. They ſhould be ſown in deep drills, and managed afterwards as the aſh.

At nine or ten years growth, the aſh may be cut for poles; and after the firſt cutting, each ſtock will throw out four or five good ſhoots at leaſt, which will be fit for poles in ſeven or eight years after.

The ſeaſon of the year for cutting aſh-poles is about the middle of December, when their ſap is moſt condenſed by the winter's cold; and in the ſpring following they will ſhoot up again with vigour. Care ſhould be taken to cut them off ſloping at about ſix inches above ground. Some recommend that the face of the cut be towards the ſouth, that the ſun may the ſooner heal the wound, by drawing up the natural juices to the ſurface of the cut, and drying them there; by which means the remaining ſtump or ſtock will be leſs apt to ſoak in wet: but others are afraid, that if the cuts lie towards the ſouth, they will be more liable to crack, open, and let in rain. Experience muſt determine which way is beſt; or whether it be not worth while to cover theſe wounds with the ſame ſort of prepared clay, or compoſt, as is uſed for grafting.

I hardly need to repeat here the caution before given in ſimilar caſes, *viz.* that all plantations of young trees ſhould be conſtantly fenced in and guarded, ſo that no cattle may at any time be able to brouſe upon them, which they will not fail to do, if they can get at them: for if the leading ſhoots be bitten off, there is an end of that growth, and the only remaining chance then is, to cut down all ſuch trees as have been thus cropped, to within ſix inches of the ground.

Hops are, like other vegetables, liable to various accidents and diſtempers, the principal and moſt fatal of which are the fly, the fen or mould, the mildew, and what the planters call fire-blaſts.

The reverend Dr. Hales, treating of this ſubject in his excellent Treatiſe of Vegetable Statics, gives us the following account of the ſtate of hops in Kent, in the year 1725, which he received from Mr. Auſten of Canterbury, who was a very great planter, and an accurate obſerver.

“ In mid April, not half the ſhoots appeared above ground; ſo that the planters knew not how to pole them to the beſt advantage.

“ Upon opening the hills, this defect of the ſhoot was found to be owing to the multitude and variety of vermin that lay preying upon the roots, and of which the increaſe was imputed to a long and almoſt uninterrupted ſeries of dry weather for three months before. Towards the end of April, many of the hop vines were infeſted with flies.

“ About the 20th of May there was a very unequal appearance, ſome vines being run ſeven feet, others not above three or four, ſome juſt tied to poles, and ſome not viſible; and this diſproportionate inequality in their ſize continued through the whole time of their growth.

“ The flies now appeared upon the leaves of the forwardeſt vines, but not in ſuch numbers here as they did in moſt other places. About the middle of June the flies increaſed, yet not ſo as to endanger the crop; but in diſtant plantations they were exceedingly multiplied, ſo as to ſwarm towards the end of the month.

“ On the 27th of June ſome ſpecks of fen appeared. From this day to the 9th of July the weather was very dry. At this time, when it was ſaid that the hops in moſt parts of the kingdom looked black and ſickly, and ſeemed paſt recovery, ours held out pretty well, in the opinion of the moſt ſkillful planters. The great leaves were indeed diſcoloured, and a little withered, and the fen was ſomewhat increaſed.

"From the 9th of July to the 23d, the fen increaſed a great deal; but the flies and lice decreaſed, it raining much daily. In a week more, the fen, which ſeemed to be almoſt at a ſtand, was conſiderably increaſed, eſpecially in thoſe lands where it firſt appeared.

"About the middle of Auguſt the vines had done growing both in ſtem and branch, and the forwardeſt began to be in hop, the reſt in bloom: the fen continued ſpreading where it was not before perceived; and not only the leaves, but many of the burs alſo were tainted with it.

"About the 20th of Auguſt ſome of the hops were infected with the fen, and whole branches were corrupted by it. Half the plantations had eſcaped pretty well hitherto, and from this time the fen increaſed but little: but ſeveral days of wind and rain in the following week diſtorted the plants ſo that many of them began to dwindle, and at laſt came to nothing; and of thoſe which then remained in bloom, ſome never turned to hops, whilſt many of thoſe which did were ſo ſmall, that they ſcarcely exceeded the ſize of a good large bur.

"We did not begin to pick till the 8th of September, which is eighteen days later than we began before. The crop was little above two hundred on an acre of ground, and not good. The beſt hops ſold this year at Way-hill for 16l. the hundred."

As a farther means of inveſtigating the cauſe of this pernicious diſtemper, Dr. Hales relates the following experiments, which he himſelf made on hops.—In the month of July, he cut off two thriving hop vines, near to the ground, in a thick ſhady part of the garden, and left the pole ſtill ſtanding. He ſtripped the leaves from off one of theſe vines and left them on the other, and then ſet their ſtems in known quantities of water in little bottles. That with leaves imbibed in a twelve hours day, four ounces, and that without leaves only three fourths of one ounce.

He took another hop pole with it's vines on it, and having carried it out of the hop-ground into a free and open expoſure, theſe plants imbibed and perſpired there double the quantity of the before mentioned which had leaves on it, in the hop-ground. This ſeems to indicate, that the reaſon why the hop vines on the outſide of gardens, where they are moſt expoſed to the air, are ſhort and poor, in compariſon of thoſe in the middle of the ground, is, becauſe, being much drier there, their fibres harden ſooner, and therefore they cannot grow ſo kindly as thoſe in the middle of the ground, which by the ſhade and ſhelter they afford each other, are always kept moiſter and more ductile.

From this perſpiration of their fluid, the ſame attentive obſerver of nature forms the following calculation.—There being a thouſand hills in an acre of hop-ground, and each hill having three poles, and each pole three vines, the number of vines will be 9000, each of which perſpiring four ounces, the ſum of all the ounces perſpired by an acre in twelve hours of day will be 36000 = 15750000 grains = 62007 cubic inches, or 220 gallons, which being divided by 6272640, the number of ſquare inches in an acre, it will be found, that the quantity of liquor perſpired by all the hop vines will be equal to an area of liquor as broad as an acre, and $\frac{1}{101}$ part of an inch deep, beſides what is evaporated from the earth.

Now this quantity of moiſture, in a kindly ſtate of the air, if daily carried of, is ſufficient to keep the hops in a healthy ſtate; but in a rainy moiſt ſtate of air, without a due mixture of dry weather, too much moiſture hovers about the hops, ſo as to hinder, in ſome meaſure, the kindly perſpiration of the leaves, whereby the ſtagnating ſap corrupts, and breeds mouldy fen, which often ſpoils whole tracts of till then flouriſhing hop-grounds.

This was the caſe in the year 1723, when, for twelve or fourteen days, almoſt continual rains fell, about the latter half of July, after four months of dry weather; upon which the moſt flouriſhing and promiſing hops were all infected with mould, or fen, in their leaves and fruit, while the then poor and unpromiſing hops eſcaped, and produced plenty, becauſe they, being ſmall, did not perſpire ſo great a quantity as others, nor did they confine the perſpired vapour ſo much as the large thriving vines did in their ſhady thickets.

The planters of hops remark, that when a mould, or fen, has once got poſſeſſion of any part of the ground, it ſoon over-runs the whole, and that even the graſs, and other herbs under the hops, are infected with it. The reaſon probably is, that the exceeding ſmall ſeeds of this quick growing mould, or moſs (for ſuch in fact it is), coming ſoon to maturity, are eaſily blown over the whole ground; and it is undoubtedly owing to the ſame cauſe, *viz.* to the remaining diſperſed ſeeds of the preceeding year's fen, that ſome grounds are infeſted with this diſtemper for ſeveral years running. The means before pointed out [a] for curing the moſs on fruit trees ſhould therefore be aſſiduouſly recurred to here, at leaſt ſo far as they can be applied to hops; and, at all events, particular care ſhould be taken to keep the land always in fine tilth, conſtantly free from weeds, and to burn all the fenny hop vines, in a place remote from the garden, as ſoon as they are picked. We have already ſeen [b] inſtances of the cure of moſs upon fruit trees, by the uſe of hog's dung; and there is no room to doubt the efficacy of the ſame remedy when applied to mouldy, or moſſy, hops.

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[a] *Page* 305—307. [b] *Page* 306, 307.

Mr. Auſten, of Canterbury, obſerves, that the fen is more fatal to thoſe grounds which lie low and are cloſely ſheltered, than to ſuch as have a high, and open ſituation; to thoſe that lie ſhelving to the north, more than to thoſe whoſe ſlope is towards the ſouth; to the middle of hop-grounds, more than to their outſides, and to dry and light grounds more than to moiſt and ſtiff ſoils. This was very apparent throughout his plantations, where the land was prepared and planted in the ſame manner, and at the ſame time.

The conjectures which have been offered in former parts of this work[c] concerning the cauſes and nature of honey-dews and of mildew, together with the account of the methods which have been, or may be, uſed with the greateſt probability of ſucceſs, either to guard againſt them, or in ſome meaſure prevent their bad conſequences, are, though there applied particularly to corn and to fruit-trees, likewiſe applicable to hops. I ſhall therefore only add here, that the honey-dews are moſt apt to fall upon hops a little before the middle of June, and that, by the middle of July, they turn their leaves black, and make them ſtink. —The mildew which lights upon hops is a white dew, that falls in ſummer at ſun-riſe, chiefly when the hops are in flower. Its fall is ſo unequal, that it ſometimes embraces a whole diſtrict, and ſometimes only parts of it. This dew dries up the hops, withers and conſumes their leaves, and conſequently ruins the crop. "There is", ſay the authors of the *Journal Oeconomique*, whoſe account of this diſtemper, to which hops are extremely liable, I ſhall copy here[d], "no other remedy from nature againſt this miſchance, except rain ſufficient to waſh the plant, and clear it entirely from this fatal dew: but as rain ſeldom comes quite ſeaſonably to the relief of the plant thus affected, artificial means have been ſought, for inſuring it againſt this accident. Some have ſurrounded their hop-grounds with hogs dung; others have employed perſons to go through the ground with veſſels full of beech aſhes, and to throw them upon the hops while the mildew was falling; and both ſides, profiting by their experience, pretend to have found a ſpecific preſervative againſt the bad effects of the mildew, They have even proceeded ſo far, as that each ſide affirm their's to be the only remedy. Thoſe who uſe hog dung ſay, that the aſhes may probably hinder the action of the dew upon the plant; but that they muſt, at the ſame time, ſtop up its pores, and deprive the ſoil of its humidity; a circumſtance equally ruinous to the plant: and that, beſides, beech is not to be found every where, and if it muſt be brought from afar, the remedy would in ſome meaſure become impracticable, by the ſcarcity and difficulty of procuring it.—The partiſans of the aſhes ſay, that they cannot comprehend how hog dung laid round the hop-ground in the ſpring, ſhould preſerve ſuch virtue as to deſtroy the bad quality of this mildew in the ſummer. In ſhort, to render this diſcuſſion complete, each ſide alledges, that the trials which they have made of the other's remedy did not ſucceed."

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[c] See *Vol.* II. *p.* 409—418, and *Vol.* IV. *p.* 304—315.

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[d] Or rather, not having the original of that work at preſent by me, I ſhall take it from the *Select Eſſays on Commerce, Agriculture, Mines, Fiſheries, and other uſeful Subjects*, tranſlated from choſen parts of the *Journal Oeconomique*, and publiſhed here by Meſſ. Wilſon and Durham, in the year 1754.

"This diſpute, the ſubject of which is highly intereſting to all countries where beer is the common drink, excited a naturaliſt to examine the nature of this mildew; and with the aſſiſtance of a microſcope he perceived it to be full of the eggs of little inſects, which fly in vaſt numbers in the air while the hop is in bloſſom. Theſe inſects gnaw the leaves even of trees, and, like others of their ſpecies, undergo various metamorphoſes. This diſcovery induced him to believe, that, as inſects are not apt to attack perfectly healthy trees, or vigorous plants, but only ſuch as are feeble and ſickly (they being endued with ſuch nice ſenſations as to diſtinguiſh by the outſide only, perhaps by the ſmell, a plant which is vitiated within, though it may appear to us to be quite fair and ſound), hog dung might probably give ſuch vigour to the hop, as to render theſe little animals afraid to attack it: for it has been remarked, that the inſects which nip a leaf, leave it as ſoon as they find in it an abundant juice, the ſalts of which, it may be preſumed, are too ſtrong for them; and that they fix on thoſe only which begin to decay and loſe their ſap. — Aſhes may likewiſe have the power of hurting them, and its ſalts may be capable of giving them diſturbance. But late experience hinders us from giving entire credit to theſe two remedies, and ſhews, that if they have ſometimes preſerved hops from the effects of the mildew, we are not to conclude that they will always anſwer this deſireable end. A very good husbandman ſaw his hops ſpoiled by the mildew, notwithſtanding the dung with which they were ſurrounded, and the aſhes that were thrown upon them: in a little time, the leaves of the plants were covered with millions of ſmall white inſects. The aſhes indeed ſeemed to kill them; but, as was obſerved above, they at the ſame time deprived the ſoil of its neceſſary moiſture. Deſirous of ſaving his hops, he recollected an axiom in medicine, importing, that bitter things kill worms: *Amarum necat vermes.* He then ordered a quantity of wormwood to be bruiſed, and having infuſed it in water, he ſprinkled his hops with the infuſion by means of a forcing pump: but he was too late, the hops being already deſtroyed. A clergyman in his neighbourhood, who was well verſed in matters of agriculture, and to whom he related his bad ſucceſs, anſwered, that when ſuch an accident happened to him, he, without giving himſelf ſo much trouble, ordered his people to ſtrip off immediately all the leaves of his hops, and that, the ſtalks puſhing out other leaves, he had at leaſt one half, and ſometimes two thirds, of his ordinary crop[e]."

"The publication of the above account concerning hops," add the writers of the *Journal Oeconomique* (whom I continue to copy) in one of their ſubſequent papers, "has excited a ſkilful farmer to communicate his experiments on this ſubject. The reader will perceive by the following extract of his letter, which we are impatient to publiſh to the world, the obligations that are due to him from all thoſe who cultivate hops, and the credit he deſerves in what he relates.

"I was informed ſome years ago, that hog's dung
" might be employed to great advantage in hop-
" gardens: nevertheleſs, as I could not conceive
" the reaſon of the advantage which the hops de-
" rived from that ſort of dung, I gave myſelf no
" trouble about uſing it preferably to any other: but
" having this laſt year loſt almoſt all my hops by

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[e] This agrees perfectly with M. de Chateauvieux's experiment of cutting off the mildewed blades of corn. *See Vol.* II. *p.* 409, 410.

" the mildew, and having obſerved but one ſingle
" place where the fruit remained entire, and in a
" perfect ſtate, I found, upon diligent inquiry,
" that my ſervants had laid hog's dung upon that
" very ſpot, preciſely where the mildew had not
" injured the fruit. I am therefore convinced of
" the good effects of this dung in hop-gardens,
" and the more ſo, as I am certain that my land
" was prepared with dung of all ſorts. The farmer
" will therefore find his account in uſing for
" his hop-grounds all his hogs dung, (which, it is
" likewiſe to be conſidered, is in general thought
" to be the leaſt ſerviceable to corn lands), and in
" covering his hop-trenches, both in autumn and
" ſpring, with the ſame kind of dung new, before
" it is rotten."

The latter part of this letter is calculated for ſuch general utility, that I cannot refrain from adding it here, though at the hazard of digreſſing from my preſent ſubject. The directions given in it are indeed uncommon; but I can hardly ſuppoſe that the writer of it would inſtance facts, without having a foundation for ſo doing.

" When hops are ſcarce, their leaves and ſprigs ought to be gathered, for ſeveral uſeful purpoſes; but they muſt be gathered with great care: no leaves ſhould be taken but ſuch as are clean, young, whole, and green; and only the tips of the ſprigs that are green, young, and full of juice. They muſt be dried in a very clean and airy place.

" Theſe may be uſed in brewing, for an after-beer, or for common ſmall beer: for by throwing in the leaves and ſprigs of hops, that beer acquires additional ſtrength, becomes the more wholſome, and will keep the longer.

" The leaves and ſprigs of hops are, during the exceſſive colds of winter, an excellent cordial to cattle, whom they ſtrengthen prodigiouſly. The method of uſing them is to infuſe them in boiling water, and to mix this infuſion with the ordinary drink of the cattle.

"Cattle may be ſtill more ſtrengthened, by mixing with their drink the tops of pines or firs; and to render theſe the more efficacious, it is proper to boil them in a kettle, that all the reſinous ſubſtances may diſſolve, and to pour the extract into their drink. Some of my cows, then kept on a little farm which is ſurrounded with mountains, were ſo affected by a prodigious cold, that the very marrow was almoſt frozen in their bones: they lay helpleſs upon the ground, and, though the beſt of fodder was given them, could not uſe their limbs or riſe up. I can aſcribe to no other cauſe than the remedy which I have juſt now pointed out, the ſurprizing cure of theſe animals. In one month's time, they were ſo well recovered, that they roſe without any aſſiſtance, and ever ſince they have reſiſted the moſt violent cold without being in the leaſt affected. The ſingularity of this event determined me to impart it to you, in order that every body may, upon the like occaſion, have recourſe to the ſame remedy."

As to the Fire-blaſt, as it is commonly called, I muſt again acknowledge, that Mr. Miller's repeating word for word, under the article *Lupulus* (the Hop), the whole of what he had ſaid before upon this ſubject in the article *Blights*, in his Gardener's Dictionary, does not render his ratiocination one jot the leſs unintelligible to me. I muſt therefore refer the reader to my former obſervation[f], and can only add here Dr. Hales's relating, that, in the month of July, which is the ſeaſon when this blight is moſt apt to affect hops, he had ſeen the vines in the middle of the hop-ground ſcorched up almoſt from one end of a large plantation to the other, when a hot gleam of ſun-ſhine came immediately after a ſhower of rain; and that, at ſuch times, vapours may be obſerved, with the naked eye, to aſcend ſo plentifully as to make an object which was before clear and diſtinct, become immediately very dim and tremulous. It was therefore, probably, owing to the much greater quantity of vapours in the middle of the hop-garden, than there was towards its ſkirts; and that middle being the denſeſt medium, the rays of the ſun may have been collected nearer to a point by paſſing through that denſer medium, than they were in the outer parts of the ground. — The courſe of the ſcorch was at right angles to the beams of the ſun at about eleven o'clock, at which time the hot gleam happened. — The hop-ground was in a valley which run from South-weſt to North-eaſt, and, to the beſt of the Doctor's remembrance, there was but little wind, and that in the courſe of the ſcorch.

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[f] *Page* 313.

END OF THE FOURTH VOLUME.